



## SEQUENCE LISTING

<110> SCARPAGE, PHILIP J.  
LI, GANG

<120> RAAV VECTOR-BASED PRO-OPIOMELANOCORTIN COMPOSITIONS AND METHODS  
OF USE

<130> 4300.015400

<150> 60/462,496

<151> 2003-04-11

<160> 54

<170> PatentIn version 3.2

<210> 1

<211> 804

<212> DNA

<213> Homo sapiens

<400> 1

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agcaacctgc tggagtgcac ccgggcctgc aagcccgacc tctcggccga gactcccatg      180
ttcccgggaa atggcgacga gcagcctctg accgagaacc cccggaagta cgtcatgggc      240
cacttccgct gggaccgatt cggccgccc aacagcagca gcagcggcag cagcggcgca      300
gggcagaagc gcgaggacgt ctccagcggg gaagactgcg gcccgtgcc tgagggcggc      360
cccgagcccc gcagcgatgg tgccaagccg ggcccgcgcg agggcaagcg ctctactcc      420
atggagcaact tccgctgggg caagccggtg ggcaagaagc ggcgcccagt gaaggtgtac      480
cctaacggcg ccgaggacga gtcggccgag gccttcccc tggagttcaa gagggagctg      540
actggccagc gactccggga gggagatggc cccgacggcc ctgccgatga cggcgcaggg      600
gcccgaggcc acctggagca cagcctgctg gtggcggccg agaagaagga cgagggcccc      660
tacaggatgg agcacttccg ctggggcagc ccgccaagg acaagcgcta cggcggtttc      720
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<211> 267

<212> PRT

<213> Homo sapiens

<400> 2

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Gln Cys Gln Asp Leu Thr Thr Glu Ser Asn Leu Leu Glu Cys Ile Arg  
 35 40 45

Ala Cys Lys Pro Asp Leu Ser Ala Glu Thr Pro Met Phe Pro Gly Asn  
 50 55 60

Gly Asp Glu Gln Pro Leu Thr Glu Asn Pro Arg Lys Tyr Val Met Gly  
 65 70 75 80

His Phe Arg Trp Asp Arg Phe Gly Arg Arg Asn Ser Ser Ser Ser Gly  
 85 90 95

Ser Ser Gly Ala Gly Gln Lys Arg Glu Asp Val Ser Ala Gly Glu Asp  
 100 105 110

Cys Gly Pro Leu Pro Glu Gly Gly Pro Glu Pro Arg Ser Asp Gly Ala  
 115 120 125

Lys Pro Gly Pro Arg Glu Gly Lys Arg Ser Tyr Ser Met Glu His Phe  
 130 135 140

Arg Trp Gly Lys Pro Val Gly Lys Lys Arg Arg Pro Val Lys Val Tyr  
 145 150 155 160

Pro Asn Gly Ala Glu Asp Glu Ser Ala Glu Ala Phe Pro Leu Glu Phe  
 165 170 175

Lys Arg Glu Leu Thr Gly Gln Arg Leu Arg Glu Gly Asp Gly Pro Asp  
 180 185 190

Gly Pro Ala Asp Asp Gly Ala Gly Ala Gln Ala Asp Leu Glu His Ser  
 195 200 205

Leu Leu Val Ala Ala Glu Lys Lys Asp Glu Gly Pro Tyr Arg Met Glu  
 210 215 220

His Phe Arg Trp Gly Ser Pro Pro Lys Asp Lys Arg Tyr Gly Gly Phe  
 225 230 235 240

Met Thr Ser Glu Lys Ser Gln Thr Pro Leu Val Thr Leu Phe Lys Asn  
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Ala Ile Ile Lys Asn Ala Tyr Lys Lys Gly Glu  
 260 265

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 <212> DNA  
 <213> Gorilla gorilla

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 cagcagcggc agcggcgagcagg ggcagaagcg cgaggatgtc tcagcgggagc aagaccgagg 180  
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 caagcgctac ggcggtttc 559

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 <211> 186  
 <212> PRT  
 <213> Gorilla gorilla

<400> 4  
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 Thr Glu Asn Pro Arg Lys Tyr Val Met Gly His Phe Arg Trp Asp Arg  
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 Phe Gly Arg Arg Asn Ser Ser Ser Ser Gly Ser Gly Ala Gly Gln  
 35 40 45  
 Lys Arg Glu Asp Val Ser Ala Gly Glu Asp Arg Gly Pro Leu Pro Glu  
 50 55 60  
 Gly Gly Pro Glu Pro Arg Ser Asp Gly Ala Lys Pro Gly Pro Arg Glu  
 65 70 75 80  
 Gly Lys Arg Ser Tyr Ser Met Glu His Phe Arg Trp Gly Lys Pro Val  
 85 90 95

Gly Lys Lys Arg Arg Pro Val Lys Val Tyr Pro Asn Gly Ala Glu Asp  
 100 105 110

Glu Ser Ala Glu Ala Phe Pro Leu Glu Phe Lys Arg Glu Leu Thr Gly  
 115 120 125

Gln Arg Pro Arg Glu Gly Asp Gly Pro Asp Gly Pro Ala Asp Asp Gly  
 130 135 140

Ala Gly Ala Gln Ala Asp Leu Glu His Ser Leu Leu Val Ala Ala Glu  
 145 150 155 160

Lys Lys Asp Glu Gly Pro Tyr Gly Met Glu His Phe Arg Trp Gly Ser  
 165 170 175

Pro Pro Lys Asp Lys Arg Tyr Gly Gly Phe  
 180 185

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 <211> 795  
 <212> DNA  
 <213> Macaca nemestrina

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 agcaacctgc tggagtgcac ccgggcctgc aagcccgacc ttccggccga gactccggtg 180  
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 <212> PRT  
 <213> Macaca nemestrina

<400> 6

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Gln Cys Gln Asp Leu Thr Thr Glu Ser Asn Leu Leu Glu Cys Ile Arg  
 35 40 45

Ala Cys Lys Pro Asp Leu Ser Ala Glu Thr Pro Val Phe Pro Gly Asn  
 50 55 60

Gly Asp Glu Gln Pro Leu Thr Glu Asn Pro Arg Lys Tyr Val Met Gly  
 65 70 75 80

His Phe Arg Trp Asp Arg Phe Gly Arg Arg Asn Ser Ser Ser Gly Ser  
 85 90 95

Ala His Gln Lys Arg Glu Asp Val Ala Ala Gly Glu Asp Arg Gly Leu  
 100 105 110

Leu Pro Glu Gly Gly Pro Glu Pro Arg Gly Asp Gly Ala Gly Pro Gly  
 115 120 125

Pro Arg Glu Gly Lys Arg Ser Tyr Ser Met Glu His Phe Arg Trp Gly  
 130 135 140

Lys Pro Val Gly Lys Lys Arg Arg Pro Val Lys Val Tyr Pro Asn Gly  
 145 150 155 160

Ala Glu Asp Glu Ser Ala Glu Ala Phe Pro Leu Glu Phe Lys Arg Glu  
 165 170 175

Leu Thr Gly Gln Arg Pro Arg Ala Gly Asp Gly Pro Asp Gly Pro Ala  
 180 185 190

Asp Asp Gly Ala Gly Pro Arg Ala Asp Leu Glu His Ser Leu Leu Val  
 195 200 205

Ala Ala Glu Lys Lys Asp Glu Gly Pro Tyr Arg Met Glu His Phe Arg  
 210 215 220

Trp Gly Ser Pro Pro Lys Asp Lys Arg Tyr Gly Gly Phe Met Thr Ser  
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Glu Lys Ser Gln Thr Pro Leu Val Thr Leu Phe Lys Asn Ala Ile Ile  
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Lys Asn Ala Tyr Lys Lys Gly Gln  
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 <212> DNA  
 <213> Pongo pygmaeus

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 caagcgctcc tactccatgg agcacttccg ctggggcaag ccggtgggca agaagcggcg 240  
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 cgatgacggc gccggggccc gggccgacct ggagcacaac ctgctggtgg cggccgagaa 420  
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<210> 8  
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 <212> PRT  
 <213> Pongo pygmaeus

<400> 8

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Ala Ala Gly Glu Asp Arg Gly Pro Leu Pro Glu Gly Gly Pro Glu Pro  
 35 40 45

Arg Ser Asp Gly Ala Glu Pro Gly Pro Arg Glu Gly Lys Arg Ser Tyr  
 50 55 60

Ser Met Glu His Phe Arg Trp Gly Lys Pro Val Gly Lys Lys Arg Arg  
65 70 75 80

Pro Val Lys Val Tyr Pro Asn Gly Ala Glu Asp Glu Ser Ala Glu Ala  
85 90 95

Phe Pro Leu Glu Phe Lys Arg Glu Pro Thr Gly Gln Arg Leu Arg Glu  
100 105 110

Gly Asp Gly Pro Asp Gly Pro Ala Asp Asp Gly Ala Gly Ala Arg Ala  
115 120 125

Asp Leu Glu His Asn Leu Leu Val Ala Ala Glu Lys Lys Asp Glu Gly  
130 135 140

Pro Tyr Arg Met Glu His Phe Arg Trp Gly Ser Pro Pro Lys Asp Lys  
145 150 155 160

Arg Tyr Gly Gly Phe  
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<210> 9

<211> 804

<212> DNA

<213> Sus scroffa

<400> 9

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tttcccggca acggcgacgc gcaaccgtg accgagaacc cccggaagta cgtcatgggc	240
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ccccgcggag atggcgctgc gccggggccc cgccaggaca agcgctccta ctccatggag	420
cacttccgct ggggcaagcc cgtgggcaag aagcggcgcc cggtgaaggt gtatccaac	480
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gcgccccccg agccggcacg ggaccccgag gccccggccg agggcgcggc cgcccgggcc	600
gagctggagt acgggctggt ggccgaggcc gaggcggccg agaagaagga cgaagggcc	660
tataagatgg agcacttccg ctggggcagc ccgccaagg acaagcgcta cggcggttc	720
atgacctcg agaagagcca gacgccctg gtcacgtgt tcaaaaacgc catcgtaag	780

aacgcccaca agaagggcca gtga

804

<210> 10  
<211> 267  
<212> PRT  
<213> Sus scroffa

<400> 10

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20 25 30

Gln Cys Gln Asp Leu Ser Thr Glu Ser Asn Leu Leu Ala Cys Ile Arg  
35 40 45

Ala Cys Lys Pro Asp Leu Ser Ala Glu Thr Pro Val Phe Pro Gly Asn  
50 55 60

Gly Asp Ala Gln Pro Leu Thr Glu Asn Pro Arg Lys Tyr Val Met Gly  
65 70 75 80

His Phe Arg Trp Asp Arg Phe Gly Arg Arg Asn Gly Ser Ser Ser Gly  
85 90 95

Gly Gly Gly Gly Gly Gly Gly Ala Gly Gln Lys Arg Glu Glu Glu Glu  
100 105 110

Val Ala Ala Gly Glu Gly Pro Gly Pro Arg Gly Asp Gly Val Ala Pro  
115 120 125

Gly Pro Arg Gln Asp Lys Arg Ser Tyr Ser Met Glu His Phe Arg Trp  
130 135 140

Gly Lys Pro Val Gly Lys Lys Arg Arg Pro Val Lys Val Tyr Pro Asn  
145 150 155 160

Gly Ala Glu Asp Glu Leu Ala Glu Ala Phe Pro Leu Glu Phe Arg Arg  
165 170 175

Glu Leu Ala Gly Ala Pro Pro Glu Pro Ala Arg Asp Pro Glu Ala Pro  
180 185 190

Ala Glu Gly Ala Ala Ala Arg Ala Glu Leu Glu Tyr Gly Leu Val Ala  
195 200 205



Glu Ala Glu Ala Ala Glu Lys Lys Asp Glu Gly Pro Tyr Lys Met Glu  
 210 215 220

His Phe Arg Trp Gly Ser Pro Pro Lys Asp Lys Arg Tyr Gly Gly Phe  
 225 230 235 240

Met Thr Ser Glu Lys Ser Gln Thr Pro Leu Val Thr Leu Phe Lys Asn  
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Ala Ile Val Lys Asn Ala His Lys Lys Gly Gln  
 260 265

<210> 11  
 <211> 798  
 <212> DNA  
 <213> Bos taurus

<400> 11  
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 cacaagaagg gccagtga 798

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 <211> 265  
 <212> PRT  
 <213> Bos taurus

<400> 12  
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Gln Cys Gln Asp Leu Thr Thr Glu Ser Asn Leu Leu Ala Cys Ile Arg  
 35 40 45

Ala Cys Lys Pro Asp Leu Ser Ala Glu Thr Pro Val Phe Pro Gly Asn  
 50 55 60

Gly Asp Glu Gln Pro Leu Thr Glu Asn Pro Arg Lys Tyr Val Met Gly  
 65 70 75 80

His Phe Arg Trp Asp Arg Phe Gly Arg Arg Asn Gly Ser Ser Ser Ser  
 85 90 95

Gly Val Gly Gly Ala Ala Gln Lys Arg Glu Glu Glu Val Ala Val Gly  
 100 105 110

Glu Gly Pro Gly Pro Arg Gly Asp Asp Ala Glu Thr Gly Pro Arg Glu  
 115 120 125

Asp Lys Arg Ser Tyr Ser Met Glu His Phe Pro Trp Gly Lys Pro Val  
 130 135 140

Gly Lys Lys Arg Arg Pro Val Lys Val Tyr Pro Asn Gly Ala Glu Asp  
 145 150 155 160

Glu Ser Ala Gln Ala Phe Pro Leu Glu Phe Lys Arg Glu Leu Thr Gly  
 165 170 175

Glu Arg Leu Glu Gln Ala Arg Gly Pro Glu Ala Gln Ala Glu Ser Ala  
 180 185 190

Ala Ala Arg Pro Glu Leu Glu Tyr Gly Leu Val Ala Glu Ala Glu Ala  
 195 200 205

Glu Ala Ala Glu Lys Lys Asp Ser Gly Pro Tyr Lys Met Glu His Phe  
 210 215 220

Arg Trp Gly Ser Pro Pro Lys Asp Lys Arg Tyr Gly Gly Phe Met Thr  
 225 230 235 240

Ser Glu Lys Ser Gln Thr Pro Leu Val Thr Leu Phe Lys Asn Ala Ile  
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Ile Lys Asn Ala His Lys Lys Gly Gln  
 260 265

<210> 13  
 <211> 663  
 <212> DNA  
 <213> Canis familiaris

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 aagtaagtca tggggccactt ccgctgggac cggtttggcc gccgcaatgg cagcgcgggc 180  
 cagaagcgcg aggaagaaga ggtggcggcg ggcggaggcc gcgccccgct gcccgcgggc 240  
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 atc 663

<210> 14  
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 <212> PRT  
 <213> Canis familiaris

<400> 14  
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 Gln Pro Leu Ala Glu Asn Pro Arg Lys Tyr Val Met Gly His Phe Arg  
 35 40 45  
 Trp Asp Arg Phe Gly Arg Arg Asn Gly Ser Ala Gly Gln Lys Arg Glu  
 50 55 60  
 Glu Glu Glu Val Ala Ala Gly Gly Gly Arg Ala Pro Leu Pro Ala Gly  
 65 70 75 80

Gly Pro Gly Pro Arg Gly Asp Gly Gly Glu Leu Gly Leu Gln Glu Gly  
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 Lys Arg Ser Tyr Ser Met Glu His Phe Arg Trp Gly Lys Pro Val Gly  
                     100                    105                    110  
  
 Lys Lys Arg Arg Pro Val Lys Val Tyr Pro Asn Gly Ala Glu Asp Glu  
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 Ser Ala Glu Ala Phe Pro Val Glu Phe Lys Arg Glu Leu Ala Gly Gln  
                     130                    135                    140  
  
 Arg Leu Glu Pro Ala Leu Gly Pro Glu Gly Pro Ala Ala Gly Val Ala  
                     145                    150                    155                    160  
  
 Ala Leu Ala Asp Leu Glu Tyr Gly Leu Val Ala Glu Ala Gly Ala Ala  
                     165                    170                    175  
  
 Glu Lys Lys Asp Asp Gly Pro Tyr Lys Met Glu His Phe Arg Trp Gly  
                     180                    185                    190  
  
 Ser Pro Pro Lys Asp Lys Arg Tyr Val Gly Phe Met Ser Ser Glu Arg  
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 <212> DNA  
 <213> *Cavia porcellus*

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 acgctgttca agaacgccat cgtcaagaac gccacaaga agggccagtg a 771

<210> 16  
 <211> 256  
 <212> PRT  
 <213> *Cavia porcellus*

<400> 16

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 20 25 30

Gln Cys Gln Asp Leu Thr Thr Glu Arg His Leu Leu Glu Cys Leu Arg  
 35 40 45

Ala Cys Lys Pro Asp Leu Ser Ala Glu Thr Pro Val Phe Pro Gly Gly  
 50 55 60

Ala Asp Glu Gln Thr Pro Thr Glu Ser Pro Arg Lys Tyr Val Thr Gly  
 65 70 75 80

His Phe Arg Trp Gly Arg Phe Gly Arg Gly Asn Ser Ser Gly Ala Ser  
 85 90 95

Gln Lys Arg Glu Glu Glu Ala Ala Ala Asp Pro Gly Phe His Gly  
 100 105 110

Asp Gly Val Glu Pro Gly Leu Arg Glu Asp Lys Arg Ser Tyr Ser Met  
 115 120 125

Glu His Phe Arg Trp Gly Lys Pro Val Gly Lys Lys Arg Arg Pro Val  
 130 135 140

Lys Val Tyr Ala Asn Gly Ala Glu Glu Glu Ser Ala Glu Ala Phe Pro  
 145 150 155 160

Leu Glu Phe Lys Arg Glu Leu Thr Gly Glu Arg Pro Ala Ala Ala Pro  
 165 170 175

Gly Pro Asp Gly Leu Gly Phe Gly Leu Val Ala Glu Ala Glu Ala Glu  
180 185 190

Ala Ala Ala Ala Glu Lys Lys Asp Ala Ala Glu Lys Lys Asp Asp Gly  
195 200 205

Ser Tyr Arg Met Glu His Phe Arg Trp Gly Thr Pro Arg Lys Gly Lys  
210 215 220

Arg Tyr Gly Gly Phe Met Thr Ser Glu Lys Ser Gln Thr Pro Leu Val  
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Thr Leu Phe Lys Asn Ala Ile Val Lys Asn Ala His Lys Lys Gly Gln  
245 250 255

<210> 17  
<211> 714  
<212> DNA  
<213> Rattus norvegicus

<400> 17  
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aaggacaagc gctacggcgg cttcatgacc tccgagaaga gccagacgcc cctggtgacg 660  
ctcttcaaga acgccatcat caagaacgcg cacaagaagg gccagtgagg gtgc 714

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<211> 235  
<212> PRT  
<213> Rattus norvegicus

<400> 18

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 20 25 30

Gln Cys Gln Asp Leu Thr Thr Glu Ser Asn Leu Leu Ala Cys Ile Arg  
 35 40 45

Ala Cys Arg Leu Asp Leu Ser Ala Glu Thr Pro Val Phe Pro Gly Asn  
 50 55 60

Gly Asp Glu Gln Pro Leu Thr Glu Asn Pro Arg Lys Tyr Val Met Gly  
 65 70 75 80

His Phe Arg Trp Asp Arg Phe Gly Pro Arg Asn Ser Ser Ser Ala Gly  
 85 90 95

Gly Ser Ala Gln Arg Arg Ala Glu Glu Glu Thr Ala Gly Gly Asp Gly  
 100 105 110

Arg Pro Glu Pro Ser Pro Arg Glu Gly Lys Arg Ser Tyr Ser Met Glu  
 115 120 125

His Phe Arg Trp Gly Lys Pro Val Gly Lys Lys Arg Arg Pro Val Lys  
 130 135 140

Val Tyr Pro Asn Val Ala Glu Asn Glu Ser Ala Glu Ala Phe Pro Leu  
 145 150 155 160

Glu Phe Lys Arg Glu Leu Glu Gly Glu Gln Pro Asp Gly Leu Glu Gln  
 165 170 175

Val Leu Glu Pro Asp Thr Glu Lys Ala Asp Gly Pro Tyr Arg Val Glu  
 180 185 190

His Phe Arg Trp Gly Asn Pro Pro Lys Asp Lys Arg Tyr Gly Gly Phe  
 195 200 205

Met Thr Ser Glu Lys Ser Gln Thr Pro Leu Val Thr Leu Phe Lys Asn  
 210 215 220

Ala Ile Ile Lys Asn Val His Lys Lys Gly Gln  
 225 230 235

<210> 19  
 <211> 708  
 <212> DNA  
 <213> Mus musculus

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<400> 19
atgccgagat tctgctacag tgcctcaggg gccctgttgc tggccctcct gcttcagacc      60
tccatagatg tgtggagctg gtgcctggag agcagccagt gccaggacct caccacggag      120
agcaacctgc tggcttgcac ccgggcttgc aaactcgacc tctcgctgga gacgcccgtg      180
tttcctggca acggagatga acagcccctg actgaaaacc cccggaagta cgtcatgggt      240
cacttccgct gggaccgctt cggccccagg aacagcagca gtgctggcag cgcggcgcag      300
aggcgtgcgg aggaagaggc ggtgtgggga gatggcagtc cagagccgag tccacgcgag      360
ggcaagcgct cctactccat ggagcacttc cgctggggca agccggtggg caagaaacgg      420
cgccccgtga aggtgtaccc caacgttgct gagaacgagt cggcggaggc ctttccccta      480
gagttcaaga gggagctgga aggcgagcgg ccattaggct tggagcaggt cctggagtcc      540
gacgcggaga aggacgacgg gccctaccgg gtggagcact tccgctggag caacccgccc      600
aaggacaagc gttacggtgg cttcatgacc tccgagaaga gccagacgcc cctggtgacg      660
ctcttcaaga acgccatcat caagaacgcg cacaagaagg gccagtga                      708

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<210> 20
<211> 235
<212> PRT
<213> Mus musculus

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<400> 20
Met Pro Arg Phe Cys Tyr Ser Arg Ser Gly Ala Leu Leu Leu Ala Leu
1          5          10          15

Leu Leu Gln Thr Ser Ile Asp Val Trp Ser Trp Cys Leu Glu Ser Ser
          20          25          30

Gln Cys Gln Asp Leu Thr Thr Glu Ser Asn Leu Leu Ala Cys Ile Arg
          35          40          45

Ala Cys Lys Leu Asp Leu Ser Leu Glu Thr Pro Val Phe Pro Gly Asn
          50          55          60

Gly Asp Glu Gln Pro Leu Thr Glu Asn Pro Arg Lys Tyr Val Met Gly
65          70          75          80

His Phe Arg Trp Asp Arg Phe Gly Pro Arg Asn Ser Ser Ser Ala Gly
          85          90          95

Ser Ala Ala Gln Arg Arg Ala Glu Glu Glu Ala Val Trp Gly Asp Gly
          100          105          110

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Ser Pro Glu Pro Ser Pro Arg Glu Gly Lys Arg Ser Tyr Ser Met Glu  
115 120 125

His Phe Arg Trp Gly Lys Pro Val Gly Lys Lys Arg Arg Pro Val Lys  
130 135 140

Val Tyr Pro Asn Val Ala Glu Asn Glu Ser Ala Glu Ala Phe Pro Leu  
145 150 155 160

Glu Phe Lys Arg Glu Leu Glu Gly Glu Arg Pro Leu Gly Leu Glu Gln  
165 170 175

Val Leu Glu Ser Asp Ala Glu Lys Asp Asp Gly Pro Tyr Arg Val Glu  
180 185 190

His Phe Arg Trp Ser Asn Pro Pro Lys Asp Lys Arg Tyr Gly Gly Phe  
195 200 205

Met Thr Ser Glu Lys Ser Gln Thr Pro Leu Val Thr Leu Phe Lys Asn  
210 215 220

Ala Ile Ile Lys Asn Ala His Lys Lys Gly Gln  
225 230 235

<210> 21  
<211> 759  
<212> DNA  
<213> Gallus gallus

<400> 21  
atgcggggcg cgctgtgcc aagcctgccc gtggtgctgg ggctgctgct gtgtcacccc 60  
accaccgccca ggggcccatg ctgggagaac agcaagtgcc aggacctggc caccgaggct 120  
gggtgttttgc aggcgtgtgc caaggcatgc cgtgctgagc tgtcggccga ggcacccgtg 180  
taccggggca atgggcacct gcagcccctc tcggagagca tccgcaagta cgtgatgagc 240  
catttccgct ggaacaagtt cggccgtcgc aacagcagca gcggagggca caaaagggag 300  
gaggtggccg gcctcgccct gcctgccgcg tcaccccacc accccgccgg ggaggaggaa 360  
gatggagaag ggttggaaac agaggaaggg aagcgtcctt actccatgga gcatttccgc 420  
tggggcaagc cgggtggggcg gaagaggaga cccatcaagg tgtaccccaa cgggggtggac 480  
gaggagtcgg ctgagagtta ccccatggag ttccggaggg agatggcgcc cgatggggac 540  
cccttcggcc tctccgagga ggaggaagaa gaggaggaag aggaaggcga ggaggaaaag 600  
aaggatggag gctcgtaccg catgcggcac ttccgctggc acgcgccgct gaaggacaag 660

cgctacggcg gcttcatgag cttggagcac agccagaccc cgctgatgac tctgttcaaa 720  
 aacgccatcg tcaaaagcgc ctacaagaag ggtcagtga 759

<210> 22  
 <211> 251  
 <212> PRT  
 <213> Gallus gallus

<400> 22

Met Arg Gly Ala Leu Cys His Ser Leu Pro Val Val Leu Gly Leu Leu  
 1 5 10 15

Leu Cys His Pro Thr Thr Ala Ser Gly Pro Cys Trp Glu Asn Ser Lys  
 20 25 30

Cys Gln Asp Leu Ala Thr Glu Ala Gly Val Leu Ala Cys Ala Lys Ala  
 35 40 45

Cys Arg Ala Glu Leu Ser Ala Glu Ala Pro Val Tyr Pro Gly Asn Gly  
 50 55 60

His Leu Gln Pro Leu Ser Glu Ser Ile Arg Lys Tyr Val Met Ser His  
 65 70 75 80

Phe Arg Trp Asn Lys Phe Gly Arg Arg Asn Ser Ser Ser Gly Gly His  
 85 90 95

Lys Arg Glu Glu Val Ala Gly Leu Ala Leu Pro Ala Ala Ser Pro His  
 100 105 110

His Pro Ala Gly Glu Glu Glu Asp Gly Glu Gly Leu Glu Arg Glu Glu  
 115 120 125

Gly Lys Arg Ser Tyr Ser Met Glu His Phe Arg Trp Gly Lys Pro Val  
 130 135 140

Gly Arg Lys Arg Arg Pro Ile Lys Val Tyr Pro Asn Gly Val Asp Glu  
 145 150 155 160

Glu Ser Ala Glu Ser Tyr Pro Met Glu Phe Arg Arg Glu Met Ala Pro  
 165 170 175

Asp Gly Asp Pro Phe Gly Leu Ser Glu Glu Glu Glu Glu Glu Glu  
 180 185 190

Glu Glu Gly Glu Glu Glu Lys Lys Asp Gly Gly Ser Tyr Arg Met Arg

195

200

205

His Phe Arg Trp His Ala Pro Leu Lys Asp Lys Arg Tyr Gly Gly Phe  
 210 215 220

Met Ser Leu Glu His Ser Gln Thr Pro Leu Met Thr Leu Phe Lys Asn  
 225 230 235 240

Ala Ile Val Lys Ser Ala Tyr Lys Lys Gly Gln  
 245 250

&lt;210&gt; 23

&lt;211&gt; 780

&lt;212&gt; DNA

&lt;213&gt; Bufo marinus

&lt;400&gt; 23

atgttgcagc caggggtggag atgtatcctg acaataactcg gggcgtttat atttcatgtc 60

ggtagaggtca agagtcagtg ctgggagagc ggtaaagtgt cagatctgac gagcgaggat 120

gggatactgg aatgtattaa agactgcaag atggctcctgt ctgcagagtc accagtgttt 180

cctgggaatg gacacatgca acccctctct gaaaacatca ggaagtatgt catgagccac 240

ttccgctgga ataagtttgg ccgaaggaat agcaccggtg gcgatagcaa caacgcaggt 300

tacaaacggg aagatatagc caactacccc atatttaacc tgttccccac taatgacaac 360

caaaacacac aagatggcaa catggaagaa gaactacgca ggcaagacaa caagaggtca 420

tattctatgg aacacttccg atggggtaaa ccagtcggga aaaaaaggag acctattaag 480

gttttcccaa gcgatgctga agaagaatca tctgaaatct scccaacaga gtacagaaga 540

gagttgtctg tagagtttga ctaccccgat accaactctg aagaagacat ggacgacagc 600

atgttgatgg aaagcccaaa tagaaaagat cggaagtata aaatgcatca ttttcgatgg 660

gaaggtccac ccaaagacaa aagatatgga ggattcatga cccctgagcg cagtcagact 720

ccactaatga ctcttttcaa aaatgccatt atcaaaaatg cccacaagaa ggggtcaataa 780

&lt;210&gt; 24

&lt;211&gt; 259

&lt;212&gt; PRT

&lt;213&gt; Bufo marinus

&lt;220&gt;

&lt;221&gt; misc\_feature

&lt;222&gt; (174)..(174)

&lt;223&gt; Xaa can be any naturally occurring amino acid

&lt;400&gt; 24

Met Leu Gln Pro Gly Trp Arg Cys Ile Leu Thr Ile Leu Gly Ala Phe  
 1 5 10 15  
 Ile Phe His Val Gly Glu Val Lys Ser Gln Cys Trp Glu Ser Gly Lys  
 20 25 30  
 Cys Ala Asp Leu Thr Ser Glu Asp Gly Ile Leu Glu Cys Ile Lys Asp  
 35 40 45  
 Cys Lys Met Val Leu Ser Ala Glu Ser Pro Val Phe Pro Gly Asn Gly  
 50 55 60  
 His Met Gln Pro Leu Ser Glu Asn Ile Arg Lys Tyr Val Met Ser His  
 65 70 75 80  
 Phe Arg Trp Asn Lys Phe Gly Arg Arg Asn Ser Thr Gly Gly Asp Ser  
 85 90 95  
 Asn Asn Ala Gly Tyr Lys Arg Glu Asp Ile Ala Asn Tyr Pro Ile Phe  
 100 105 110  
 Asn Leu Phe Pro Thr Asn Asp Asn Gln Asn Thr Gln Asp Gly Asn Met  
 115 120 125  
 Glu Glu Glu Leu Arg Arg Gln Asp Asn Lys Arg Ser Tyr Ser Met Glu  
 130 135 140  
 His Phe Arg Trp Gly Lys Pro Val Gly Lys Lys Arg Arg Pro Ile Lys  
 145 150 155 160  
 Val Phe Pro Ser Asp Ala Glu Glu Glu Ser Ser Glu Ile Xaa Pro Thr  
 165 170 175  
 Glu Tyr Arg Arg Glu Leu Ser Val Glu Phe Asp Tyr Pro Asp Thr Asn  
 180 185 190  
 Ser Glu Glu Asp Met Asp Asp Ser Met Leu Met Glu Ser Pro Asn Arg  
 195 200 205  
 Lys Asp Arg Lys Tyr Lys Met His His Phe Arg Trp Glu Gly Pro Pro  
 210 215 220  
 Lys Asp Lys Arg Tyr Gly Gly Phe Met Thr Pro Glu Arg Ser Gln Thr  
 225 230 235 240  
 Pro Leu Met Thr Leu Phe Lys Asn Ala Ile Ile Lys Asn Ala His Lys

245

250

255

Lys Gly Gln

<210> 25  
 <211> 669  
 <212> DNA  
 <213> *Cyprinus carpio*

<400> 25  
 atggtgaggg gagagaggat gttgtgtcct gcttggtctt tggctctggc tgttctgtgt 60  
 gcggctggat ctgaagtcag agctcagtgt atggaggacg cccgctgcag agacctcacc 120  
 actgatgaga acatcttggg ctgcatacag ctatgcaggt ctgatctgac agatgaaacc 180  
 cccgtctacc ctggagaaaag ccatttgcag cctccctctg agctggagca aaccgaggtc 240  
 ctctgacccc tgtccccagc ggcctctgct cctgctgagc aaatggaccc cgagtccagc 300  
 cctcagcacg agcacaagcg ctctactcc atggagcatt tccgctgggg aaagccagtg 360  
 ggtcgcaagc gcaggcctat caaggtgtac accaacggcg tggaggagga atccaccgag 420  
 actctcccag ctgagatgag gcgcgagctg gctacaaacg agatcgacta tcctcaagag 480  
 gagggcgctt taaaccagca ggataagaag gatggctcct acaaaatgag ccatttccgc 540  
 tggagcagcc cgctgctag caagcgctat ggaggcttca tgaagtctg ggacgagcgc 600  
 agtcagaaac cccttctcac gctcttcaaa aacgtcataa acaaagagca ccagaagaag 660  
 gaccagtga 669

<210> 26  
 <211> 222  
 <212> PRT  
 <213> *Cyprinus carpio*

<400> 26  
 Met Val Arg Gly Glu Arg Met Leu Cys Pro Ala Trp Leu Leu Ala Leu  
 1 5 10 15  
 Ala Val Leu Cys Ala Ala Gly Ser Glu Val Arg Ala Gln Cys Met Glu  
 20 25 30  
 Asp Ala Arg Cys Arg Asp Leu Thr Thr Asp Glu Asn Ile Leu Asp Cys  
 35 40 45  
 Ile Gln Leu Cys Arg Ser Asp Leu Thr Asp Glu Thr Pro Val Tyr Pro  
 50 55 60

Gly Glu Ser His Leu Gln Pro Pro Ser Glu Leu Glu Gln Thr Glu Val  
65 70 75 80

Leu Val Pro Leu Ser Pro Ala Ala Leu Ala Pro Ala Glu Gln Met Asp  
85 90 95

Pro Glu Ser Ser Pro Gln His Glu His Lys Arg Ser Tyr Ser Met Glu  
100 105 110

His Phe Arg Trp Gly Lys Pro Val Gly Arg Lys Arg Arg Pro Ile Lys  
115 120 125

Val Tyr Thr Asn Gly Val Glu Glu Glu Ser Thr Glu Thr Leu Pro Ala  
130 135 140

Glu Met Arg Arg Glu Leu Ala Thr Asn Glu Ile Asp Tyr Pro Gln Glu  
145 150 155 160

Glu Gly Ala Leu Asn Gln Gln Asp Lys Lys Asp Gly Ser Tyr Lys Met  
165 170 175

Ser His Phe Arg Trp Ser Ser Pro Pro Ala Ser Lys Arg Tyr Gly Gly  
180 185 190

Phe Met Lys Ser Trp Asp Glu Arg Ser Gln Lys Pro Leu Leu Thr Leu  
195 200 205

Phe Lys Asn Val Ile Asn Lys Glu His Gln Lys Lys Asp Gln  
210 215 220

<210> 27  
<211> 669  
<212> DNA  
<213> Danio rerio

<400> 27  
atggtgaggg gagtgaggat gttgtgtcct gcttggtctt tggtctctggc tgttctctgc 60  
gcaggaggat ctgaagtcag agctcagtg tgggaaaatg cccgctgtcg agacctcagc 120  
acagaggaga acatcttggg atgcatacaa ttatgcaggt ctgaacttac agatgaaacc 180  
cccgtctacc ctggagaaaag ccatctacag cctccctccg agccggagca aatcgacctc 240  
ctcgcacacc tttcccctgt agcactcgca gccctgaac agatagagcc ggagtccggc 300  
cctcgacacg accacaagcg ctctactcc atggaacact tccggtgggg caaaccggtc 360  
ggccgcaaac gcagacccat caaggtgtac acgaacggcg tggaagagga atccgccgaa 420  
acgcttccgg aagagatgag acgcgagctg gcaaataacg aggtcgacta tccgcaagaa 480

gagatgcctt taaacccact gggaaagaag gacccccctt acaaaatgac ccatttcgcg 540  
 tggagcgtcc cgccggctag caagcgctat ggaggcttca tgaagtcctg ggacgagcgt 600  
 gctcagaaac cactgctcac actcttcaaa aacgtaatgc ataaaggcca accgaggaag 660  
 gatgagtga 669

<210> 28  
 <211> 222  
 <212> PRT  
 <213> Danio rerio

<400> 28

Met Val Arg Gly Val Arg Met Leu Cys Pro Ala Trp Leu Leu Ala Leu  
 1 5 10 15

Ala Val Leu Cys Ala Gly Gly Ser Glu Val Arg Ala Gln Cys Trp Glu  
 20 25 30

Asn Ala Arg Cys Arg Asp Leu Ser Thr Glu Glu Asn Ile Leu Glu Cys  
 35 40 45

Ile Gln Leu Cys Arg Ser Glu Leu Thr Asp Glu Thr Pro Val Tyr Pro  
 50 55 60

Gly Glu Ser His Leu Gln Pro Pro Ser Glu Pro Glu Gln Ile Asp Leu  
 65 70 75 80

Leu Ala His Leu Ser Pro Val Ala Leu Ala Ala Pro Glu Gln Ile Glu  
 85 90 95

Pro Glu Ser Gly Pro Arg His Asp His Lys Arg Ser Tyr Ser Met Glu  
 100 105 110

His Phe Arg Trp Gly Lys Pro Val Gly Arg Lys Arg Arg Pro Ile Lys  
 115 120 125

Val Tyr Thr Asn Gly Val Glu Glu Glu Ser Ala Glu Thr Leu Pro Glu  
 130 135 140

Glu Met Arg Arg Glu Leu Ala Asn Asn Glu Val Asp Tyr Pro Gln Glu  
 145 150 155 160

Glu Met Pro Leu Asn Pro Leu Gly Lys Lys Asp Pro Pro Tyr Lys Met  
 165 170 175

Thr His Phe Arg Trp Ser Val Pro Pro Ala Ser Lys Arg Tyr Gly Gly  
 180 185 190

Phe Met Lys Ser Trp Asp Glu Arg Ala Gln Lys Pro Leu Leu Thr Leu  
 195 200 205

Phe Lys Asn Val Met His Lys Gly Gln Pro Arg Lys Asp Glu  
 210 215 220

<210> 29  
 <211> 792  
 <212> DNA  
 <213> Rana catesbeiana

<400> 29  
 atgttgccagc cagtctggca cgcctgtatc ctggcaatac ttgggggtggt catatttcat 60  
 gtcggagagg tccggagcca gtgctgggaa agcaataagt gtacagattt aagcagcgaa 120  
 gatggcattc tggaatgtat caaagcatgc aagatggacc tctctgcaga atctcccgtg 180  
 tttcccggca atggccacat ccagcccctt tctgaaaaca tcaggaaata tgtcatgagc 240  
 cacttttcgct ggaataaatt tggtagaagg aacagcacca gcaatgacaa caacaacaac 300  
 aatggtggct ataagcggga ggatattgcc aactacccta tattgaacct gttccttggc 360  
 agcgacaacc aaaacacaca ggagggaatt atggaagatg acgccttgga taggcaagac 420  
 agcaaaagggt cttattccat ggagcacttc cgatggggaa aaccgcgtcg caagaagagg 480  
 aggcctatca aagttttccc cacagatgct gaagaagagt cctcagaaag tttccccatt 540  
 gagctgagaa gagagctctc tctagagttt gactatcctg acaccaactc cgaagaagaa 600  
 ttggataatg gcgagctgct agaaggtcca gttaaaaaag gtaggaagta caaaatgcac 660  
 catttccgat ggggaaggacc tcccaaagac aagcggtatg gtggatttat gaccccagag 720  
 agaagccaga cacctttaat gactcttttc aagaatgcta taattaagaa cgcccacaaa 780  
 aagggccagt ag 792

<210> 30  
 <211> 263  
 <212> PRT  
 <213> Rana catesbeiana

<400> 30

Met Leu Gln Pro Val Trp His Ala Cys Ile Leu Ala Ile Leu Gly Val  
 1 5 10 15

Phe Ile Phe His Val Gly Glu Val Arg Ser Gln Cys Trp Glu Ser Asn  
 20 25 30



Lys Cys Thr Asp Leu Ser Ser Glu Asp Gly Ile Leu Glu Cys Ile Lys  
 35 40 45  
 Ala Cys Lys Met Asp Leu Ser Ala Glu Ser Pro Val Phe Pro Gly Asn  
 50 55 60  
 Gly His Ile Gln Pro Leu Ser Glu Asn Ile Arg Lys Tyr Val Met Ser  
 65 70 75 80  
 His Phe Arg Trp Asn Lys Phe Gly Arg Arg Asn Ser Thr Ser Asn Asp  
 85 90 95  
 Asn Asn Asn Asn Asn Gly Gly Tyr Lys Arg Glu Asp Ile Ala Asn Tyr  
 100 105 110  
 Pro Ile Leu Asn Leu Phe Leu Gly Ser Asp Asn Gln Asn Thr Gln Glu  
 115 120 125  
 Gly Ile Met Glu Asp Asp Ala Leu Asp Arg Gln Asp Ser Lys Arg Ser  
 130 135 140  
 Tyr Ser Met Glu His Phe Arg Trp Gly Lys Pro Val Gly Lys Lys Arg  
 145 150 155 160  
 Arg Pro Ile Lys Val Phe Pro Thr Asp Ala Glu Glu Glu Ser Ser Glu  
 165 170 175  
 Ser Phe Pro Ile Glu Leu Arg Arg Glu Leu Ser Leu Glu Phe Asp Tyr  
 180 185 190  
 Pro Asp Thr Asn Ser Glu Glu Glu Leu Asp Asn Gly Glu Leu Leu Glu  
 195 200 205  
 Gly Pro Val Lys Lys Gly Arg Lys Tyr Lys Met His His Phe Arg Trp  
 210 215 220  
 Glu Gly Pro Pro Lys Asp Lys Arg Tyr Gly Gly Phe Met Thr Pro Glu  
 225 230 235 240  
 Arg Ser Gln Thr Pro Leu Met Thr Leu Phe Lys Asn Ala Ile Ile Lys  
 245 250 255  
 Asn Ala His Lys Lys Gly Gln  
 260

<210> 31  
 <211> 272  
 <212> PRT  
 <213> Monodelphis domestica

<400> 31

Met Pro Lys Pro Ser Trp Ser Tyr Leu Gly Ala Leu Leu Val Ala Val  
 1 5 10 15

Leu Phe Gln Ala Ser Val Glu Val His Gly Trp Cys Leu Gln Ala Ser  
 20 25 30

Asn Cys Arg Asp Ser Lys Ala Glu Asp Gly Leu Val Glu Cys Ile Lys  
 35 40 45

Ser Cys Lys Met Asp Leu Ser Ala Glu Ser Pro Val Phe Pro Gly Asn  
 50 55 60

Gly Gln Tyr Glu Pro Leu Ser Glu Asn Ile Arg Lys Tyr Val Met Ser  
 65 70 75 80

His Phe Arg Trp Asn Lys Phe Gly Arg Arg Asn Ile Ser Ser Gly Ser  
 85 90 95

Ile Ser Ser Asp Gly Gly Asn Val Gly Gln Lys Arg Gln Glu Leu Met  
 100 105 110

Gln Gly Asp Phe Leu Asp Leu Pro Pro Pro Gly Val Trp Gly Glu Asp  
 115 120 125

Glu Glu Met Gln Glu Gly Leu Pro Leu Ile Arg Lys Ala Arg Glu Leu  
 130 135 140

Gln Asn Lys Arg Ser Tyr Ser Met Glu His Phe Arg Trp Gly Lys Pro  
 145 150 155 160

Val Gly Lys Lys Arg Arg Pro Val Lys Ile Tyr Pro Asn Gly Val Glu  
 165 170 175

Glu Glu Ser Ala Glu Ser Tyr Pro Val Glu Ile Arg Arg Asp Leu Pro  
 180 185 190

Met Lys Ile Asn Phe Pro Glu Tyr Pro Glu Leu Ala Ile Asp Glu Glu  
 195 200 205

Glu Ala Ala Lys Glu Val Tyr Glu Glu Lys Val Lys Lys Asp Gly Gly  
 210 215 220

Gly Tyr Lys Met Glu His Phe Arg Trp Gly Thr Pro Pro Lys Asp Lys  
 225 230 235 240

Arg Tyr Gly Gly Phe Met Ile Ser Glu Lys Ser His Thr Pro Leu Met  
 245 250 255

Thr Leu Phe Lys Asn Ala Ile Ile Lys Asn Gly His Lys Lys Gly Gln  
 260 265 270

<210> 32  
 <211> 263  
 <212> PRT  
 <213> Ovis aries

<220>  
 <221> misc\_feature  
 <222> (184)..(184)  
 <223> Xaa can be any naturally occurring amino acid  
 <400> 32

Met Pro Arg Leu Cys Ser Ser Arg Ser Gly Ala Leu Leu Leu Val Leu  
 1 5 10 15

Leu Leu Gln Ala Ser Met Glu Val Arg Gly Trp Cys Leu Glu Ser Ser  
 20 25 30

Gln Cys Gln Asp Leu Thr Thr Glu Ser Asn Leu Leu Ala Cys Ile Arg  
 35 40 45

Ala Cys Lys Pro Asp Leu Ser Ala Glu Thr Pro Val Phe Pro Gly Asn  
 50 55 60

Gly Asp Glu Gln Pro Leu Thr Glu Asn Pro Arg Lys Tyr Val Met Gly  
 65 70 75 80

His Phe Arg Trp Asp Arg Phe Gly Arg Arg Asn Gly Ser Ser Ser Phe  
 85 90 95

Gly Ala Gly Gly Ala Ala Gln Lys Arg Glu Glu Glu Val Ala Val Gly  
 100 105 110

Glu Gly Pro Gly Pro Arg Gly Asp Gly Ala Glu Thr Gly Pro Arg Glu  
 115 120 125

Asp Lys Arg Ser Tyr Ser Met Glu His Phe Arg Trp Gly Lys Pro Val  
 130 135 140

Gly Lys Lys Arg Arg Pro Val Lys Val Tyr Pro Asn Gly Ala Glu Asp  
 145 150 155 160

Glu Ser Ala Gln Ala Phe Pro Leu Glu Phe Lys Arg Glu Leu Thr Gly  
 165 170 175

Glu Arg Leu Glu Gln Ala Arg Xaa Pro Glu Ala Gln Ala Glu Ser Ala  
 180 185 190

Ala Ala Arg Ala Glu Leu Glu Tyr Gly Leu Val Ala Glu Ala Glu Ala  
 195 200 205

Ala Glu Lys Lys Asp Ser Gly Pro Tyr Lys Met Glu His Phe Arg Trp  
 210 215 220

Gly Ser Pro Pro Lys Asp Lys Arg Tyr Gly Gly Phe Met Thr Ser Glu  
 225 230 235 240

Lys Ser Gln Thr Pro Leu Val Thr Leu Phe Lys Asn Ala Ile Ile Lys  
 245 250 255

Asn Ala His Lys Lys Gly Gln  
 260

<210> 33  
 <211> 212  
 <212> PRT  
 <213> Ovis aries

<220>  
 <221> misc\_feature  
 <222> (120)..(121)  
 <223> Xaa can be any naturally occurring amino acid

<400> 33

Pro Asp Leu Ser Ala Glu Thr Pro Val Phe Pro Gly Asn Cys Asp Glu  
 1 5 10 15

Gln Pro Leu Thr Glu Asn Pro Arg Lys Tyr Val Met Gly His Phe Arg  
 20 25 30

Trp Asp Arg Phe Gly Arg Arg Asn Gly Ser Ser Ser Phe Gly Ala Gly  
 35 40 45

Gly Ala Ala Gln Lys Arg Glu Glu Glu Val Ala Val Gly Glu Gly Pro  
 50 55 60

Gly Pro Arg Gly Asp Gly Ala Glu Thr Gly Pro Arg Glu Asp Lys Arg  
65 70 75 80

Ser Tyr Ser Met Glu His Phe Arg Trp Gly Lys Pro Val Gly Lys Lys  
85 90 95

Arg Arg Pro Val Lys Val Tyr Pro Asn Gly Ala Glu Asp Glu Ser Ala  
100 105 110

Gln Ala Phe Pro Leu Glu Phe Xaa Xaa Glu Leu Thr Gly Glu Arg Leu  
115 120 125

Glu Gln Ala Arg Gly Pro Glu Ala Gln Ala Glu Ser Ala Ala Ala Arg  
130 135 140

Ala Glu Leu Glu Tyr Gly Leu Val Ala Glu Ala Glu Ala Ala Glu Lys  
145 150 155 160

Lys Asp Ser Gly Pro Tyr Lys Met Glu His Phe Arg Trp Gly Ser Pro  
165 170 175

Pro Lys Asp Lys Arg Tyr Gly Gly Phe Met Thr Ser Glu Lys Ser Gln  
180 185 190

Thr Pro Leu Val Thr Leu Phe Lys Asn Ala Ile Ile Lys Asn Ala His  
195 200 205

Lys Lys Gly Gln  
210

<210> 34  
<211> 263  
<212> PRT  
<213> Rana catesbeiana

<400> 34

Met Leu Gln Pro Val Trp His Ala Cys Ile Leu Ala Ile Leu Gly Val  
1 5 10 15

Phe Ile Phe His Val Gly Glu Val Arg Ser Gln Cys Trp Glu Ser Asn  
20 25 30

Lys Cys Thr Asp Leu Ser Ser Glu Asp Gly Ile Leu Glu Cys Ile Lys  
35 40 45

Ala Cys Lys Met Asp Leu Ser Ala Glu Ser Pro Val Phe Pro Gly Asn  
50 55 60

Gly His Ile Gln Pro Leu Ser Glu Asn Ile Arg Lys Tyr Val Met Ser  
65 70 75 80

His Phe Arg Trp Asn Lys Phe Gly Arg Arg Asn Ser Thr Ser Asn Asp  
85 90 95

Asn Asn Asn Asn Asn Gly Gly Tyr Lys Arg Glu Asp Ile Ala Asn Tyr  
100 105 110

Pro Ile Leu Asn Leu Phe Leu Gly Ser Asp Asn Gln Asn Thr Gln Glu  
115 120 125

Gly Ile Met Glu Asp Asp Ala Leu Asp Arg Gln Asp Ser Lys Arg Ser  
130 135 140

Tyr Ser Met Glu His Phe Arg Trp Gly Lys Pro Val Gly Lys Lys Arg  
145 150 155 160

Arg Pro Ile Lys Val Phe Pro Thr Asp Ala Glu Glu Glu Ser Ser Glu  
165 170 175

Ser Phe Pro Ile Glu Leu Arg Arg Glu Leu Ser Leu Glu Phe Asp Tyr  
180 185 190

Pro Asp Thr Asn Ser Glu Glu Glu Leu Asp Asn Gly Glu Leu Leu Glu  
195 200 205

Gly Pro Val Lys Lys Gly Arg Lys Tyr Lys Met His His Phe Arg Trp  
210 215 220

Glu Gly Pro Pro Lys Asp Lys Arg Tyr Gly Gly Phe Met Thr Pro Glu  
225 230 235 240

Arg Ser Gln Thr Pro Leu Met Thr Leu Phe Lys Asn Ala Ile Ile Lys  
245 250 255

Asn Ala His Lys Lys Gly Gln  
260

<210> 35  
<211> 258  
<212> PRT  
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<400> 35

Met Leu Cys Pro Val Trp Ser Cys Leu Phe Ala Val Leu Gly Val Phe  
1 5 10 15

Val Phe His Val Gly Glu Val Arg Gly Gln Cys Trp Gln Ser Ala Lys  
20 25 30

Cys Met Asp Leu Glu Ser Glu Asp Gly Ile Leu Glu Cys Ile Lys Ala  
35 40 45

Cys Lys Thr Asp Leu Ser Ala Glu Ser Pro Ile Phe Pro Gly Asn Gly  
50 55 60

His Leu Gln Pro Leu Ala Glu Asn Val Arg Lys Tyr Val Met Ser His  
65 70 75 80

Phe Arg Trp Asn Lys Phe Gly Arg Arg Asn Thr Thr Gly Asn Glu Gly  
85 90 95

Asn Ser Gly Ser Lys Arg Glu Asp Ile Ala Asn Tyr Pro Ile Phe Asn  
100 105 110

Leu Phe Pro Ser Ser Asn Gly Gln Asn Thr Glu Asp Asn Met Trp Lys  
115 120 125

Lys Tyr Gln Asp Arg Gln Asp Asn Lys Arg Ser Tyr Ser Met Glu His  
130 135 140

Phe Arg Trp Gly Lys Pro Val Gly Arg Lys Arg Arg Pro Ile Lys Val  
145 150 155 160

Phe Pro Asn Gly Met Glu Glu Glu Ser Ser Glu Ser Tyr Pro Met Glu  
165 170 175

Leu Arg Arg Glu Leu Ser Leu Glu Asp Asp Tyr Pro Glu Ile Asp Ser  
180 185 190

Glu Asp Asp Leu Asp Tyr Asn Asp Leu Leu Ser Met Pro Lys Phe Lys  
195 200 205

Gly Gly Asp Tyr Arg Ile His His Phe Arg Trp Gly Ser Pro Pro Lys  
210 215 220

Asp Lys Arg Tyr Gly Gly Phe Met Thr Pro Glu Arg Ser Gln Thr Pro  
225 230 235 240

Leu Met Thr Leu Phe Lys Asn Ala Ile Ile Lys Asn Ala His Lys Lys  
245 250 255

Ala Gln

<210> 36  
<211> 259  
<212> PRT  
<213> *Xenopus laevis*

<400> 36

Met Phe Arg Pro Leu Trp Gly Cys Phe Leu Ala Ile Leu Gly Ile Cys  
1 5 10 15

Ile Phe His Ile Gly Glu Val Gln Ser Gln Cys Trp Glu Ser Ser Arg  
20 25 30

Cys Ala Asp Leu Ser Ser Glu Asp Gly Val Leu Glu Cys Ile Lys Ala  
35 40 45

Cys Lys Thr Asp Leu Ser Ala Glu Ser Pro Val Phe Pro Gly Asn Gly  
50 55 60

His Leu Gln Pro Leu Ser Glu Ser Ile Arg Lys Tyr Val Met Thr His  
65 70 75 80

Phe Arg Trp Asn Lys Phe Gly Arg Arg Asn Ser Thr Gly Asn Asp Gly  
85 90 95

Ser Asn Thr Gly Tyr Lys Arg Glu Asp Ile Ser Ser Tyr Pro Val Phe  
100 105 110

Ser Leu Phe Pro Leu Ser Asp Gln Asn Ala Pro Gly Asp Asn Met Glu  
115 120 125

Glu Glu Pro Leu Asp Arg Gln Glu Asn Lys Arg Ala Tyr Ser Met Glu  
130 135 140

His Phe Arg Trp Gly Lys Pro Val Gly Arg Lys Arg Arg Pro Ile Lys  
145 150 155 160

Val Tyr Pro Asn Gly Val Glu Glu Glu Ser Ala Glu Ser Tyr Pro Met  
165 170 175

Glu Leu Arg Arg Glu Leu Ser Leu Glu Leu Asp Tyr Pro Glu Ile Asp



180	185	190
Leu Asp Glu Asp Ile Glu Asp Asn Glu Val Lys Ser Ala Leu Thr Lys		
195	200	205
Lys Asn Gly Asn Tyr Arg Met His His Phe Arg Trp Gly Ser Pro Pro		
210	215	220
Lys Asp Lys Arg Tyr Gly Gly Phe Met Thr Pro Glu Arg Ser Gln Thr		
225	230	235
Pro Leu Met Thr Leu Phe Lys Asn Ala Ile Ile Lys Asn Ser His Lys		
245	250	255

Lys Gly Gln

<210> 37  
 <211> 262  
 <212> PRT  
 <213> Necturus maculosus

<220>  
 <221> misc\_feature  
 <222> (129)..(129)  
 <223> Xaa can be any naturally occurring amino acid  
 <400> 37

Met Leu Lys Pro Val Trp Ser Cys Leu Phe Ala Thr Leu Gly Ala Leu
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Leu Cys Gln Thr Val Val Ala His Ser Gln Cys Trp Glu Ser Ser Lys
20 25 30
Cys Arg Asp Leu Ala Thr Glu Gly Ser Val Leu Glu Cys Ile Lys Ala
35 40 45
Cys Lys Val Glu Leu Ser Ala Glu Ser Pro Val Tyr Pro Gly Asn Gly
50 55 60
His Met Gln Pro Leu Ser Glu Asn Ile Arg Lys Tyr Val Met Ser His
65 70 75 80
Phe Arg Trp Asn Gln Phe Gly Arg Lys Asn Ser Thr Val Ala Ser Gly
85 90 95
Asn Gly Ala Gly Ser Lys Arg Glu Glu Leu Ser Gly Asn Pro Ile Ile

100	105	110
Ser Leu Phe Thr Thr Ser Glu Ser Gln Ser Ser Gly Ala His Asp Ser		
115	120	125
Xaa Lys Glu Gly Glu Val Met Asp Arg Gln Asp Asn Lys Arg Ser Tyr		
130	135	140
Ser Met Glu His Phe Arg Trp Gly Lys Pro Val Gly Arg Lys Arg Arg		
145	150	155
Pro Ile Lys Val Tyr Pro Asn Gly Val Glu Glu Glu Ser Ser Glu Ser		
165	170	175
Tyr Pro Leu Glu Leu Lys Arg Asp Leu Ser Leu Gly Leu Glu Tyr Pro		
180	185	190
Glu Phe Asp Ser Gln Glu Gly Leu Glu Asn Asn Glu Val Met Val Val		
195	200	205
Leu Pro Glu Lys Lys Asp Gly Asn Tyr Arg Met His His Phe Arg Trp		
210	215	220
Gly Ser Pro Pro Lys Asp Lys Arg Tyr Gly Gly Phe Met Thr Pro Glu		
225	230	235
Arg Ser Gln Thr Pro Leu Met Thr Leu Phe Lys Asn Ala Ile Lys Asn		
245	250	255
Ala His Lys Lys Gly Gln		
260		

<210> 38  
 <211> 262  
 <212> PRT  
 <213> Amphiuma means

<400> 38

Met Leu Arg Pro Val Trp Ser Cys Leu Pro Ala Thr Leu Gly Ala Leu
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Leu Cys Gln Thr Ala Gly Ala Asn Ser Gln Cys Trp Glu Ser Ser Lys
20                      25                      30
Cys Arg Asp Leu Ala Thr Glu Gly Ser Val Leu Glu Cys Ile Lys Ala
35                      40                      45

Cys Lys Val Glu Leu Ser Ala Glu Ser Pro Val Tyr Pro Gly Asn Gly  
 50 55 60

His Met Gln Pro Leu Ser Glu Asn Ile Arg Lys Tyr Val Met Ser His  
 65 70 75 80

Phe Arg Trp Asn Lys Phe Gly Arg Lys Asn Ser Thr Ser Val Ser Gly  
 85 90 95

Asn Ser Ala Gly Asn Lys Arg Glu Glu Leu Ser Asn Asn Pro Ile Ile  
 100 105 110

Ser Leu Phe Thr Thr Ser Glu Ser Gln Ser Ser Gly Ala Asp Asp Gly  
 115 120 125

Asn Lys Glu Gly Glu Ala Met Glu Arg Gln Asp Ser Lys Arg Ser Tyr  
 130 135 140

Ser Met Glu His Phe Arg Trp Gly Lys Pro Val Gly Arg Lys Arg Arg  
 145 150 155 160

Pro Ile Lys Val Tyr Pro Asn Gly Val Glu Glu Glu Ser Ser Glu Ser  
 165 170 175

Tyr Pro Leu Glu Leu Arg Arg Asp Leu Ser Leu Gly Leu Asp Tyr Pro  
 180 185 190

Asp Ser Asp Ser Gln Glu Gly Leu Glu Asn Asn Glu Ile Thr Thr Gly  
 195 200 205

Leu Thr Lys Lys Asn Asp Lys Gln Tyr Arg Ile Gly His Phe Arg Trp  
 210 215 220

Gly Ser Pro Leu Lys Asp Lys Arg Tyr Gly Gly Phe Met Thr Pro Glu  
 225 230 235 240

Arg Ser Gln Thr Pro Leu Met Thr Leu Phe Lys Asn Ala Ile Lys Asn  
 245 250 255

Ala His Lys Lys Gly Gln  
 260

<210> 39  
 <211> 261  
 <212> PRT  
 <213> Pelodiscus sinensis

<400> 39

Met Leu Lys Pro Val Arg Ser Gly Leu Leu Ala Ile Leu Gly Val Leu  
1 5 10 15

Leu Phe His Ala Asp Gly Gly Val His Ser Gln Cys Trp Asp Ser Ser  
20 25 30

Arg Cys Arg Glu Leu Ser Thr Asp Ala Gly Leu Leu Glu Cys Ile Lys  
35 40 45

Ala Cys Lys Met Asp Leu Ser Asp Glu Ser Pro Met Tyr Pro Gly Asn  
50 55 60

Gly His Leu Gln Pro Leu Ser Glu Asn Ile Arg Lys Tyr Val Met Ser  
65 70 75 80

His Phe Arg Trp Asn Lys Phe Gly Arg Lys Asn Ser Ser Ser Ser Val  
85 90 95

Ala Gly His Lys Arg Glu Glu Ile Pro Ser His Leu Leu Leu Gly Leu  
100 105 110

Phe Pro Asp Val Ala Pro Ala Gln Arg Gly Asp Asp Gly Glu Gly Gly  
115 120 125

Ala Ala Leu Glu Arg Gln Asp Ser Lys Arg Ser Tyr Ser Met Glu His  
130 135 140

Phe Arg Trp Gly Lys Pro Val Gly Arg Lys Arg Arg Pro Ile Lys Val  
145 150 155 160

Tyr Pro Ser Glu Val Glu Glu Glu Ser Ala Glu Ser Tyr Pro Pro Glu  
165 170 175

Phe Arg Arg Asp Leu Ser Met Glu Leu Asp Tyr Pro Glu Phe Glu Ser  
180 185 190

Leu Glu Asp Pro Glu Ser Glu Glu Ala Leu Val Ser Glu Glu Ala Glu  
195 200 205

Lys Lys Asp Gly Asn Ser Tyr Lys Met His His Phe Arg Trp Asn Ala  
210 215 220

Pro Pro Lys Asp Lys Arg Tyr Gly Gly Phe Met Thr Ser Glu Ser Ser  
225 230 235 240

Gln Thr Pro Leu Met Thr Leu Phe Lys Asn Ala Ile Ile Lys Asn Ala  
 245 250 255

Tyr Lys Lys Gly Gln  
 260

<210> 40  
 <211> 187  
 <212> PRT  
 <213> Pan troglodytes

<400> 40

Ser Ala Glu Thr Pro Met Phe Pro Gly Asn Gly Asp Glu Gln Pro Leu  
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Thr Glu Asn Pro Arg Lys Tyr Val Met Gly His Phe Arg Trp Asp Arg  
 20 25 30

Phe Gly Arg Arg Asn Ser Ser Ser Ser Ser Ser Gly Ser Gly Ala Gly  
 35 40 45

Gln Lys Arg Glu Asp Val Ser Ala Gly Glu Asp Arg Gly Pro Leu Pro  
 50 55 60

Glu Gly Gly Pro Glu Pro Arg Ser Asp Gly Ala Lys Pro Gly Pro Arg  
 65 70 75 80

Glu Gly Lys Arg Ser Tyr Ser Met Glu His Phe Arg Trp Gly Lys Pro  
 85 90 95

Val Gly Lys Lys Arg Arg Pro Val Lys Val Tyr Pro Asn Gly Ala Glu  
 100 105 110

Asp Glu Ser Ala Glu Ala Phe Pro Leu Glu Phe Lys Arg Glu Leu Thr  
 115 120 125

Gly Gln Arg Pro Arg Glu Gly Asp Gly Pro Asp Gly Pro Ala Asp Asp  
 130 135 140

Gly Ala Gly Ala Gln Ala Asp Leu Glu His Ser Leu Leu Val Ala Ala  
 145 150 155 160

Glu Lys Lys Asp Glu Gly Pro Tyr Arg Met Glu His Phe Arg Trp Gly  
 165 170 175

Ser Pro Pro Lys Asp Lys Arg Tyr Gly Gly Phe  
180 185

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<223> SYNTHETIC OLIGONUCLEOTIDE

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<210> 42  
<211> 20  
<212> DNA  
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<220>  
<223> SYNTHETIC OLIGONUCLEOTIDE

<400> 42  
cttgatgatg gcgttcttga 20

<210> 43  
<211> 22  
<212> DNA  
<213> Artificial

<220>  
<223> SYNTHETIC OLIGONUCLEOTIDE

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<210> 44  
<211> 22  
<212> DNA  
<213> Artificial

<220>  
<223> SYNTHETIC OLIGONUCLEOTIDE

<400> 44  
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<220>  
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 <211> 20  
 <212> DNA  
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<220>  
 <223> SYNTHETIC OLIGONUCLEOTIDE

<400> 46  
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<210> 47  
 <211> 21  
 <212> DNA  
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 <223> SYNTHETIC OLIGONUCLEOTIDE

<400> 47  
 atggggctgt gtggactgac c 21

<210> 48  
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<210> 49  
 <211> 22  
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 <213> Artificial

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<210> 50  
 <211> 22  
 <212> DNA  
 <213> Artificial

<220>  
 <223> SYNTHETIC OLIGONUCLEOTIDE

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<220>		
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<400>	53	
	agtctctggg gaaggggca	19
<210>	54	
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<223>	SYNTHETIC OLIGONUCLEOTIDE	
<400>	54	
	caactgatga tgatcccgac	20





# SEQUENCE LISTING

<110> SCARPACE, PHILIP J.  
LI, GANG

<120> RAAV VECTOR-BASED PRO-OPIOMELANOCORTIN COMPOSITIONS AND METHODS  
OF USE

<130> 4300.015400

<150> 60/462,496  
<151> 2003-04-11

<160> 54

<170> PatentIn version 3.2

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<211> 804  
<212> DNA  
<213> Homo sapiens

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agcaacctgc tggagtgcac ccgggcctgc aagcccgacc tctcggccga gactcccatg 180  
ttcccgggaa atggcgacga gcagcctctg accgagaacc cccggaagta cgtcatgggc 240  
cacttccgct gggaccgatt cggccgcccgc aacagcagca gcagcggcag cagcggcgca 300  
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atggagcact tccgctgggg caagccggtg ggcaagaagc ggcgcccagt gaaggtgtac 480  
cctaacggcg ccgaggacga gtcggccgag gccttcccc tggagttcaa gagggagctg 540  
actggccagc gactccggga gggagatggc cccgacggcc ctgccgatga cggcgcaggg 600  
gccagggccg acctggagca cagcctgctg gtggcgggccg agaagaagga cgagggcccc 660  
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<211> 267  
<212> PRT  
<213> Homo sapiens

<400> 2

Met Pro Arg Ser Cys Cys Ser Arg Ser Gly Ala Leu Leu Leu Ala Leu  
1 5 10 15

Leu Leu Gln Ala Ser Met Glu Val Arg Gly Trp Cys Leu Glu Ser Ser  
20 25 30

Gln Cys Gln Asp Leu Thr Thr Glu Ser Asn Leu Leu Glu Cys Ile Arg  
35 40 45

Ala Cys Lys Pro Asp Leu Ser Ala Glu Thr Pro Met Phe Pro Gly Asn  
50 55 60

Gly Asp Glu Gln Pro Leu Thr Glu Asn Pro Arg Lys Tyr Val Met Gly  
65 70 75 80

His Phe Arg Trp Asp Arg Phe Gly Arg Arg Asn Ser Ser Ser Ser Gly  
85 90 95

Ser Ser Gly Ala Gly Gln Lys Arg Glu Asp Val Ser Ala Gly Glu Asp  
100 105 110

Cys Gly Pro Leu Pro Glu Gly Gly Pro Glu Pro Arg Ser Asp Gly Ala  
115 120 125

Lys Pro Gly Pro Arg Glu Gly Lys Arg Ser Tyr Ser Met Glu His Phe  
130 135 140

Arg Trp Gly Lys Pro Val Gly Lys Lys Arg Arg Pro Val Lys Val Tyr  
145 150 155 160

Pro Asn Gly Ala Glu Asp Glu Ser Ala Glu Ala Phe Pro Leu Glu Phe  
165 170 175

Lys Arg Glu Leu Thr Gly Gln Arg Leu Arg Glu Gly Asp Gly Pro Asp  
180 185 190

Gly Pro Ala Asp Asp Gly Ala Gly Ala Gln Ala Asp Leu Glu His Ser  
195 200 205

Leu Leu Val Ala Ala Glu Lys Lys Asp Glu Gly Pro Tyr Arg Met Glu  
210 215 220

His Phe Arg Trp Gly Ser Pro Pro Lys Asp Lys Arg Tyr Gly Gly Phe  
 225 230 235 240

Met Thr Ser Glu Lys Ser Gln Thr Pro Leu Val Thr Leu Phe Lys Asn  
 245 250 255

Ala Ile Ile Lys Asn Ala Tyr Lys Lys Gly Glu  
 260 265

<210> 3  
 <211> 559  
 <212> DNA  
 <213> Gorilla gorilla

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 ccggaagtac gtcattgggcc acttccgctg ggaccgattc ggccgccgca acagcagcag 120  
 cagcagcggc agcggcgagc ggcagaagcg cgaggatgtc tcagcgggag aagaccgcgg 180  
 cccgctgcct gagggcgagg cccagccccc cagtgatggt gccaaagccg gcccgcgcga 240  
 gggcaagcgc tcctactcca tggagcactt ccgctggggc aagccggtgg gcaagaagcg 300  
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 ggagttcaag agggagctga ctggccagcg accccgggag ggagatggcc ccgacggccc 420  
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 caagcgctac ggcggtttc 559

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 <211> 186  
 <212> PRT  
 <213> Gorilla gorilla

<400> 4

Ser Ala Glu Thr Pro Met Phe Pro Gly Asn Gly Asp Glu Gln Pro Leu  
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Thr Glu Asn Pro Arg Lys Tyr Val Met Gly His Phe Arg Trp Asp Arg  
 20 25 30

Phe Gly Arg Arg Asn Ser Ser Ser Ser Gly Ser Gly Ala Gly Gln  
 35 40 45

Lys Arg Glu Asp Val Ser Ala Gly Glu Asp Arg Gly Pro Leu Pro Glu  
50 55 60

Gly Gly Pro Glu Pro Arg Ser Asp Gly Ala Lys Pro Gly Pro Arg Glu  
65 70 75 80

Gly Lys Arg Ser Tyr Ser Met Glu His Phe Arg Trp Gly Lys Pro Val  
85 90 95

Gly Lys Lys Arg Arg Pro Val Lys Val Tyr Pro Asn Gly Ala Glu Asp  
100 105 110

Glu Ser Ala Glu Ala Phe Pro Leu Glu Phe Lys Arg Glu Leu Thr Gly  
115 120 125

Gln Arg Pro Arg Glu Gly Asp Gly Pro Asp Gly Pro Ala Asp Asp Gly  
130 135 140

Ala Gly Ala Gln Ala Asp Leu Glu His Ser Leu Leu Val Ala Ala Glu  
145 150 155 160

Lys Lys Asp Glu Gly Pro Tyr Gly Met Glu His Phe Arg Trp Gly Ser  
165 170 175

Pro Pro Lys Asp Lys Arg Tyr Gly Gly Phe  
180 185

<210> 5  
<211> 795  
<212> DNA  
<213> Macaca nemestrina

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agcaacctgc tggagtgcac ccgggcctgc aagcccgaacc tttcggccga gactccggtg 180  
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cgcgaggacg tcgcggctgg cgaagaccgc ggccctgtac ctgaggggtg ccccgagccc 360  
cgtggcgatg gcgccgggccc gggcccgcgc gagggcaagc gctcctactc catggagcac 420

ttccgctggg gcaagccggt gggcaagaag cggcgccccg tgaaggtgta ccccaatggc	480
gccgaggacg agtcggccga ggccttcccc ctggagttca agaggagct gaccggccag	540
cggccccggg cgggggatgg ccccgatggc cctgccgacg acggcgcggg gccccgggcc	600
gacctggagc acagcctgct ggtggcggcc gagaagaagg atgagggcc ctacaggatg	660
gagcacttcc gctggggcag cccgcccagg gacaagcgct acggcggtt catgacctcc	720
gagaagagcc agactcccct ggtgacactg ttcaaaaacg ccatcatcaa gaacgcctac	780
aagaagggcc agtga	795

<210> 6  
 <211> 264  
 <212> PRT  
 <213> Macaca nemestrina

<400> 6

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			20					25					30		
Gln	Cys	Gln	Asp	Leu	Thr	Thr	Glu	Ser	Asn	Leu	Leu	Glu	Cys	Ile	Arg
		35					40					45			
Ala	Cys	Lys	Pro	Asp	Leu	Ser	Ala	Glu	Thr	Pro	Val	Phe	Pro	Gly	Asn
	50					55					60				
Gly	Asp	Glu	Gln	Pro	Leu	Thr	Glu	Asn	Pro	Arg	Lys	Tyr	Val	Met	Gly
65					70					75				80	
His	Phe	Arg	Trp	Asp	Arg	Phe	Gly	Arg	Arg	Asn	Ser	Ser	Ser	Gly	Ser
				85					90					95	
Ala	His	Gln	Lys	Arg	Glu	Asp	Val	Ala	Ala	Gly	Glu	Asp	Arg	Gly	Leu
			100					105					110		
Leu	Pro	Glu	Gly	Gly	Pro	Glu	Pro	Arg	Gly	Asp	Gly	Ala	Gly	Pro	Gly
		115					120					125			
Pro	Arg	Glu	Gly	Lys	Arg	Ser	Tyr	Ser	Met	Glu	His	Phe	Arg	Trp	Gly
	130					135					140				

Lys Pro Val Gly Lys Lys Arg Arg Pro Val Lys Val Tyr Pro Asn Gly  
 145 150 155 160

Ala Glu Asp Glu Ser Ala Glu Ala Phe Pro Leu Glu Phe Lys Arg Glu  
 165 170 175

Leu Thr Gly Gln Arg Pro Arg Ala Gly Asp Gly Pro Asp Gly Pro Ala  
 180 185 190

Asp Asp Gly Ala Gly Pro Arg Ala Asp Leu Glu His Ser Leu Leu Val  
 195 200 205

Ala Ala Glu Lys Lys Asp Glu Gly Pro Tyr Arg Met Glu His Phe Arg  
 210 215 220

Trp Gly Ser Pro Pro Lys Asp Lys Arg Tyr Gly Gly Phe Met Thr Ser  
 225 230 235 240

Glu Lys Ser Gln Thr Pro Leu Val Thr Leu Phe Lys Asn Ala Ile Ile  
 245 250 255

Lys Asn Ala Tyr Lys Lys Gly Gln  
 260

<210> 7  
 <211> 496  
 <212> DNA  
 <213> Pongo pygmaeus

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 <211> 165  
 <212> PRT  
 <213> Pongo pygmaeus

<400> 8

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Ser Ser Ser Gly Ser Gly Ser Gly Ala Gly Gln Lys Arg Glu Asp Val  
 20 25 30

Ala Ala Gly Glu Asp Arg Gly Pro Leu Pro Glu Gly Gly Pro Glu Pro  
 35 40 45

Arg Ser Asp Gly Ala Glu Pro Gly Pro Arg Glu Gly Lys Arg Ser Tyr  
 50 55 60

Ser Met Glu His Phe Arg Trp Gly Lys Pro Val Gly Lys Lys Arg Arg  
 65 70 75 80

Pro Val Lys Val Tyr Pro Asn Gly Ala Glu Asp Glu Ser Ala Glu Ala  
 85 90 95

Phe Pro Leu Glu Phe Lys Arg Glu Pro Thr Gly Gln Arg Leu Arg Glu  
 100 105 110

Gly Asp Gly Pro Asp Gly Pro Ala Asp Asp Gly Ala Gly Ala Arg Ala  
 115 120 125

Asp Leu Glu His Asn Leu Leu Val Ala Ala Glu Lys Lys Asp Glu Gly  
 130 135 140

Pro Tyr Arg Met Glu His Phe Arg Trp Gly Ser Pro Pro Lys Asp Lys  
 145 150 155 160

Arg Tyr Gly Gly Phe  
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<210> 9  
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 <212> DNA  
 <213> Sus scroffa

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gagctggagt acgggctggt ggccgaggcc gaggcggccg agaagaagga cgaagggccc 660
tataagatgg agcacttccg ctggggcagc ccgccaag acaagcgcta cggcggttc 720
atgacctccg agaagagcca gacgcccctg gtcacgctgt tcaaaaacgc catcgtcaag 780
aacgcccaca agaagggccca gtga 804

```

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<210> 10
<211> 267
<212> PRT
<213> Sus scroffa

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<400> 10

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Met Pro Arg Leu Cys Gly Ser Arg Ser Gly Ala Leu Leu Leu Thr Leu
1          5          10          15

```

```

Leu Leu Gln Ala Ser Met Gly Val Arg Gly Trp Cys Leu Glu Ser Ser
20          25          30

```

```

Gln Cys Gln Asp Leu Ser Thr Glu Ser Asn Leu Leu Ala Cys Ile Arg
35          40          45

```

```

Ala Cys Lys Pro Asp Leu Ser Ala Glu Thr Pro Val Phe Pro Gly Asn
50          55          60

```

```

Gly Asp Ala Gln Pro Leu Thr Glu Asn Pro Arg Lys Tyr Val Met Gly
65          70          75          80

```



His Phe Arg Trp Asp Arg Phe Gly Arg Arg Asn Gly Ser Ser Ser Gly  
85 90 95

Gly Gly Gly Gly Gly Gly Gly Ala Gly Gln Lys Arg Glu Glu Glu Glu  
100 105 110

Val Ala Ala Gly Glu Gly Pro Gly Pro Arg Gly Asp Gly Val Ala Pro  
115 120 125

Gly Pro Arg Gln Asp Lys Arg Ser Tyr Ser Met Glu His Phe Arg Trp  
130 135 140

Gly Lys Pro Val Gly Lys Lys Arg Arg Pro Val Lys Val Tyr Pro Asn  
145 150 155 160

Gly Ala Glu Asp Glu Leu Ala Glu Ala Phe Pro Leu Glu Phe Arg Arg  
165 170 175

Glu Leu Ala Gly Ala Pro Pro Glu Pro Ala Arg Asp Pro Glu Ala Pro  
180 185 190

Ala Glu Gly Ala Ala Ala Arg Ala Glu Leu Glu Tyr Gly Leu Val Ala  
195 200 205

Glu Ala Glu Ala Ala Glu Lys Lys Asp Glu Gly Pro Tyr Lys Met Glu  
210 215 220

His Phe Arg Trp Gly Ser Pro Pro Lys Asp Lys Arg Tyr Gly Gly Phe  
225 230 235 240

Met Thr Ser Glu Lys Ser Gln Thr Pro Leu Val Thr Leu Phe Lys Asn  
245 250 255

Ala Ile Val Lys Asn Ala His Lys Lys Gly Gln  
260 265

<210> 11  
<211> 798  
<212> DNA  
<213> Bos taurus

<400> 11  
atgccgagac tgtgcagcag tcgttcggcc gccctgctgc tggccttgct gcttcaggcc 60

tccatggaag tgcgtggttg gtgcctggag agcagccagt gtcaggacct caccacggaa	120
agtaacctgc tggcgtgcat ccgggcctgc aagcccgaacc tctccgccga gacgccggtg	180
ttccccggca acggcgatga gcagccgtg actgagaacc cccggaagta cgtcatgggc	240
catttccgct gggaccgctt cggccgtcgg aatggtagca gcagcagcgg agttgggggc	300
gcggcccaga agcgcgagga ggaagtggcg gtgggcgaag gccccgggccc ccgcggcgat	360
gacgccgaga cgggtccgcg cgaggacaag cgttcttact ccatggaaca cttcccctgg	420
ggcaagccgg tgggcaagaa gcggcgcccc gtgaaggtgt accccaacgg cgccgaggac	480
gagtcggccc aggcctttcc cctcgaattc aagagggagc tgaccgggga gaggctcgag	540
caggcgcgcg gccccgaggc ccaggctgag agtgcgggccg cccggcctga gctggagtat	600
ggcctggtgg cggaggcgga ggctgaggcg gccgagaaga aggactcggg gccctataag	660
atggaacact tccgctgggg cagcccggcc aaggacaagc gctacggcgg gttcatgacc	720
tccgagaaga gccaaacgcc ccttgtcacg ctgttcaaaa acgccatcat caagaacgcc	780
cacaagaagg gccagtga	798

<210> 12  
 <211> 265  
 <212> PRT  
 <213> Bos taurus

<400> 12

Met	Pro	Arg	Leu	Cys	Ser	Ser	Arg	Ser	Ala	Ala	Leu	Leu	Leu	Ala	Leu
1				5					10					15	

Leu	Leu	Gln	Ala	Ser	Met	Glu	Val	Arg	Gly	Trp	Cys	Leu	Glu	Ser	Ser
			20					25					30		

Gln	Cys	Gln	Asp	Leu	Thr	Thr	Glu	Ser	Asn	Leu	Leu	Ala	Cys	Ile	Arg
		35					40					45			

Ala	Cys	Lys	Pro	Asp	Leu	Ser	Ala	Glu	Thr	Pro	Val	Phe	Pro	Gly	Asn
	50					55					60				

Gly	Asp	Glu	Gln	Pro	Leu	Thr	Glu	Asn	Pro	Arg	Lys	Tyr	Val	Met	Gly
65					70					75				80	

His	Phe	Arg	Trp	Asp	Arg	Phe	Gly	Arg	Arg	Asn	Gly	Ser	Ser	Ser	Ser
				85						90				95	

Gly Val Gly Gly Ala Ala Gln Lys Arg Glu Glu Glu Val Ala Val Gly  
100 105 110

Glu Gly Pro Gly Pro Arg Gly Asp Asp Ala Glu Thr Gly Pro Arg Glu  
115 120 125

Asp Lys Arg Ser Tyr Ser Met Glu His Phe Pro Trp Gly Lys Pro Val  
130 135 140

Gly Lys Lys Arg Arg Pro Val Lys Val Tyr Pro Asn Gly Ala Glu Asp  
145 150 155 160

Glu Ser Ala Gln Ala Phe Pro Leu Glu Phe Lys Arg Glu Leu Thr Gly  
165 170 175

Glu Arg Leu Glu Gln Ala Arg Gly Pro Glu Ala Gln Ala Glu Ser Ala  
180 185 190

Ala Ala Arg Pro Glu Leu Glu Tyr Gly Leu Val Ala Glu Ala Glu Ala  
195 200 205

Glu Ala Ala Glu Lys Lys Asp Ser Gly Pro Tyr Lys Met Glu His Phe  
210 215 220

Arg Trp Gly Ser Pro Pro Lys Asp Lys Arg Tyr Gly Gly Phe Met Thr  
225 230 235 240

Ser Glu Lys Ser Gln Thr Pro Leu Val Thr Leu Phe Lys Asn Ala Ile  
245 250 255

Ile Lys Asn Ala His Lys Lys Gly Gln  
260 265

<210> 13  
<211> 663  
<212> DNA  
<213> Canis familiaris

<400> 13  
gacctcacca cggaaagtaa cctgctggcg tgcattccggg cctgcaagcc cgacctctcc 60  
gccgagacgc ccgtgctccc cggcaacggc gacgagcagc cgctggctga gaacccccgg 120  
aagtacgtca tgggccactt ccgctgggac cggtttggcc gccgcaatgg cagcgcgggc 180

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cagaagcgcg aggaagaaga ggtggcgggc ggcgagggcc gcgccccgct gcccgcgggc 240
ggccccggggc cccgcggcga cggtggcgag ctccggcctgc aagagggcaa gcgctcctac 300
tccatggagc acttccgctg gggcaagccg gtgggcaaga agcggcgccc ggtgaaggtg 360
taccccaacg gcgctgagga cgagtcggcc gaggccttcc ccgtcgagtt caagagggag 420
ctggccgggc agcggctgga gccggcgctc ggccccgagg gcccggccgc gggcgtggcg 480
gcgctggccg acctggagta cggcctgggtg gcggaggccg gggcgggcca gaagaaggac 540
gacggggcctt acaagatgga gcacttcgc tggggcagcc cgccaagga caagcgctac 600
gtcggcttca tgagctcgga gaggagccag acgcccctgg tgacgctggt caaaaacgcc 660
atc 663

```

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<210> 14
<211> 221
<212> PRT
<213> Canis familiaris

```

```

<400> 14

```

```

Asp Leu Thr Thr Glu Ser Asn Leu Leu Ala Cys Ile Arg Ala Cys Lys
1          5          10          15

```

```

Pro Asp Leu Ser Ala Glu Thr Pro Val Leu Pro Gly Asn Gly Asp Glu
          20          25          30

```

```

Gln Pro Leu Ala Glu Asn Pro Arg Lys Tyr Val Met Gly His Phe Arg
          35          40          45

```

```

Trp Asp Arg Phe Gly Arg Arg Asn Gly Ser Ala Gly Gln Lys Arg Glu
          50          55          60

```

```

Glu Glu Glu Val Ala Ala Gly Gly Gly Arg Ala Pro Leu Pro Ala Gly
65          70          75          80

```

```

Gly Pro Gly Pro Arg Gly Asp Gly Gly Glu Leu Gly Leu Gln Glu Gly
          85          90          95

```

```

Lys Arg Ser Tyr Ser Met Glu His Phe Arg Trp Gly Lys Pro Val Gly
          100          105          110

```

```

Lys Lys Arg Arg Pro Val Lys Val Tyr Pro Asn Gly Ala Glu Asp Glu
          115          120          125

```

Ser Ala Glu Ala Phe Pro Val Glu Phe Lys Arg Glu Leu Ala Gly Gln  
 130 135 140

Arg Leu Glu Pro Ala Leu Gly Pro Glu Gly Pro Ala Ala Gly Val Ala  
 145 150 155 160

Ala Leu Ala Asp Leu Glu Tyr Gly Leu Val Ala Glu Ala Gly Ala Ala  
 165 170 175

Glu Lys Lys Asp Asp Gly Pro Tyr Lys Met Glu His Phe Arg Trp Gly  
 180 185 190

Ser Pro Pro Lys Asp Lys Arg Tyr Val Gly Phe Met Ser Ser Glu Arg  
 195 200 205

Ser Gln Thr Pro Leu Val Thr Leu Phe Lys Asn Ala Ile  
 210 215 220

<210> 15  
 <211> 771  
 <212> DNA  
 <213> Cavia porcellus

<400> 15  
 atgccgagat cgtgctacag ccgctcgggg accctgctgc tggccttgct gcttcagatc 60  
 tccatggaag tgcggggctg gtgcctggag agcagccagt gtcaggacct caccacggag 120  
 agacacctgc tggagtgcct ccgggacctgc aaaccggacc tctcggccga gacgccagt 180  
 tttccggggg gcgccgacga gcagacgccg accgagagcc cccggaagta cgtcacgggc 240  
 cacttccgct ggggccgctt cggccgcggt aacagcagcg gcgcgagcca gaagcgtgag 300  
 gaggaggcgg cggcgggccga ccccggttc cacggcgatg gcgtcgagcc gggcctgcgc 360  
 gaggacaagc gctcctactc catggagcac ttccgctggg gcaagccggt gggcaagaag 420  
 cggcgccccg tgaaggtgta cgcgaacggc gcggaggagg agtcggccga ggcctttccg 480  
 cttgagttca agcgggagct gaccggggag cggcccgcgg cggcgccccg ccccgacggc 540  
 ctgggggttcg gcctggtggc tgaggccgag gccgaggcgg cagcggccga gaagaaggac 600  
 gcggccgaga agaaggacga cgggtcctat cgcattggagc acttccgctg gggcaccctg 660  
 cgcaagggca agcgtctacg cggcttcatt acctcggaga agagccagac gccgctgggtg 720  
 acgctgttca agaacgccat cgtcaagaac gccacaaga agggccagtg a 771

<210> 16  
<211> 256  
<212> PRT  
<213> Cavia porcellus

<400> 16

Met Pro Arg Ser Cys Tyr Ser Arg Ser Gly Thr Leu Leu Leu Ala Leu  
1 5 10 15

Leu Leu Gln Ile Ser Met Glu Val Arg Gly Trp Cys Leu Glu Ser Ser  
20 25 30

Gln Cys Gln Asp Leu Thr Thr Glu Arg His Leu Leu Glu Cys Leu Arg  
35 40 45

Ala Cys Lys Pro Asp Leu Ser Ala Glu Thr Pro Val Phe Pro Gly Gly  
50 55 60

Ala Asp Glu Gln Thr Pro Thr Glu Ser Pro Arg Lys Tyr Val Thr Gly  
65 70 75 80

His Phe Arg Trp Gly Arg Phe Gly Arg Gly Asn Ser Ser Gly Ala Ser  
85 90 95

Gln Lys Arg Glu Glu Glu Ala Ala Ala Ala Asp Pro Gly Phe His Gly  
100 105 110

Asp Gly Val Glu Pro Gly Leu Arg Glu Asp Lys Arg Ser Tyr Ser Met  
115 120 125

Glu His Phe Arg Trp Gly Lys Pro Val Gly Lys Lys Arg Arg Pro Val  
130 135 140

Lys Val Tyr Ala Asn Gly Ala Glu Glu Glu Ser Ala Glu Ala Phe Pro  
145 150 155 160

Leu Glu Phe Lys Arg Glu Leu Thr Gly Glu Arg Pro Ala Ala Ala Pro  
165 170 175

Gly Pro Asp Gly Leu Gly Phe Gly Leu Val Ala Glu Ala Glu Ala Glu  
180 185 190

Ala Ala Ala Ala Glu Lys Lys Asp Ala Ala Glu Lys Lys Asp Asp Gly

195

200

205

Ser Tyr Arg Met Glu His Phe Arg Trp Gly Thr Pro Arg Lys Gly Lys  
 210 215 220

Arg Tyr Gly Gly Phe Met Thr Ser Glu Lys Ser Gln Thr Pro Leu Val  
 225 230 235 240

Thr Leu Phe Lys Asn Ala Ile Val Lys Asn Ala His Lys Lys Gly Gln  
 245 250 255

&lt;210&gt; 17

&lt;211&gt; 714

&lt;212&gt; DNA

&lt;213&gt; Rattus norvegicus

&lt;400&gt; 17

atgccgagat tctgctacag tcgctcaggg gccctgctgc tggccctcct gcttcagacc 60  
 tccatagacg tgtggagctg gtgcctggag agcagccagt gccaggacct caccacggaa 120  
 agcaacctgc tggcttgcat ccgggcctgc agactcgacc tctcggcgga gacgcccgtg 180  
 tttccaggca acggagatga acagcccttg actgaaaatc cccggaagta cgtcatgggt 240  
 cacttccgct gggaccgctt cggcccgaga aacagcagca gtgctggcgg ctacagcgag 300  
 aggcgtgcgg aggaagagac ggcgggggga gatggccgtc cggagccaag tccacggggag 360  
 ggcaagcgtc cctactccat ggagcacttc cgctggggca agccggtggg caagaagcgg 420  
 cgccctgtga aggtgtaccc caatgtcgcc gagaacgagt cggccgaggc ctttccccta 480  
 gagttcaaga gggagctgga aggcgagcag cctgatggct tggagcacgt cctggagccg 540  
 gataccgaga aggccgacgg gccctatcgg gtggagcact tccgctgggg caaccgccc 600  
 aaggacaagc gctacggcgg cttcatgacc tccgagaaga gccagacgcc cctggtgacg 660  
 ctcttcaaga acgcatcat caagaacgcg cacaagaagg gccagtgagg gtgc 714

&lt;210&gt; 18

&lt;211&gt; 235

&lt;212&gt; PRT

&lt;213&gt; Rattus norvegicus

&lt;400&gt; 18

Met Pro Arg Phe Cys Tyr Ser Arg Ser Gly Ala Leu Leu Leu Ala Leu  
 1 5 10 15

Leu Leu Gln Thr Ser Ile Asp Val Trp Ser Trp Cys Leu Glu Ser Ser  
20 25 30

Gln Cys Gln Asp Leu Thr Thr Glu Ser Asn Leu Leu Ala Cys Ile Arg  
35 40 45

Ala Cys Arg Leu Asp Leu Ser Ala Glu Thr Pro Val Phe Pro Gly Asn  
50 55 60

Gly Asp Glu Gln Pro Leu Thr Glu Asn Pro Arg Lys Tyr Val Met Gly  
65 70 75 80

His Phe Arg Trp Asp Arg Phe Gly Pro Arg Asn Ser Ser Ser Ala Gly  
85 90 95

Gly Ser Ala Gln Arg Arg Ala Glu Glu Glu Thr Ala Gly Gly Asp Gly  
100 105 110

Arg Pro Glu Pro Ser Pro Arg Glu Gly Lys Arg Ser Tyr Ser Met Glu  
115 120 125

His Phe Arg Trp Gly Lys Pro Val Gly Lys Lys Arg Arg Pro Val Lys  
130 135 140

Val Tyr Pro Asn Val Ala Glu Asn Glu Ser Ala Glu Ala Phe Pro Leu  
145 150 155 160

Glu Phe Lys Arg Glu Leu Glu Gly Glu Gln Pro Asp Gly Leu Glu Gln  
165 170 175

Val Leu Glu Pro Asp Thr Glu Lys Ala Asp Gly Pro Tyr Arg Val Glu  
180 185 190

His Phe Arg Trp Gly Asn Pro Pro Lys Asp Lys Arg Tyr Gly Gly Phe  
195 200 205

Met Thr Ser Glu Lys Ser Gln Thr Pro Leu Val Thr Leu Phe Lys Asn  
210 215 220

Ala Ile Ile Lys Asn Val His Lys Lys Gly Gln  
225 230 235

<210> 19



<211> 708  
 <212> DNA  
 <213> Mus musculus

<400> 19  
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 tccatagatg tgtggagctg gtgcctggag agcagccagt gccaggacct caccacggag 120  
 agcaacctgc tggcttgcat ccgggcttgc aaactcgacc tctcgctgga gacgcccgtg 180  
 tttcctggca acggagatga acagcccctg actgaaaacc cccggaagta cgtcatgggt 240  
 cacttccgct gggaccgctt cggccccagg aacagcagca gtgctggcag cgcggcgcag 300  
 aggcgtgcgg aggaagaggc ggtgtgggga gatggcagtc cagagccgag tccacgcgag 360  
 ggcaagcgct cctactccat ggagcacttc cgctggggca agccggtggg caagaaacgg 420  
 cgcccgggtga aggtgtaccc caacgttgct gagaacgagt cggcggaggc ctttccccta 480  
 gagttcaaga gggagctgga aggcgagcgg ccattaggct tggagcaggt cctggagtcc 540  
 gacgcggaga aggacgacgg gccctaccgg gtggagcact tccgctggag caaccgccc 600  
 aaggacaagc gttacggtgg cttcatgacc tccgagaaga gccagacgcc cctggtgacg 660  
 ctcttcaaga acgcatcat caagaacgcg cacaagaagg gccagtga 708

<210> 20  
 <211> 235  
 <212> PRT  
 <213> Mus musculus

<400> 20  
 Met Pro Arg Phe Cys Tyr Ser Arg Ser Gly Ala Leu Leu Leu Ala Leu  
 1 5 10 15  
 Leu Leu Gln Thr Ser Ile Asp Val Trp Ser Trp Cys Leu Glu Ser Ser  
 20 25 30  
 Gln Cys Gln Asp Leu Thr Thr Glu Ser Asn Leu Leu Ala Cys Ile Arg  
 35 40 45  
 Ala Cys Lys Leu Asp Leu Ser Leu Glu Thr Pro Val Phe Pro Gly Asn  
 50 55 60  
 Gly Asp Glu Gln Pro Leu Thr Glu Asn Pro Arg Lys Tyr Val Met Gly  
 65 70 75 80

His Phe Arg Trp Asp Arg Phe Gly Pro Arg Asn Ser Ser Ser Ala Gly  
85 90 95

Ser Ala Ala Gln Arg Arg Ala Glu Glu Glu Ala Val Trp Gly Asp Gly  
100 105 110

Ser Pro Glu Pro Ser Pro Arg Glu Gly Lys Arg Ser Tyr Ser Met Glu  
115 120 125

His Phe Arg Trp Gly Lys Pro Val Gly Lys Lys Arg Arg Pro Val Lys  
130 135 140

Val Tyr Pro Asn Val Ala Glu Asn Glu Ser Ala Glu Ala Phe Pro Leu  
145 150 155 160

Glu Phe Lys Arg Glu Leu Glu Gly Glu Arg Pro Leu Gly Leu Glu Gln  
165 170 175

Val Leu Glu Ser Asp Ala Glu Lys Asp Asp Gly Pro Tyr Arg Val Glu  
180 185 190

His Phe Arg Trp Ser Asn Pro Pro Lys Asp Lys Arg Tyr Gly Gly Phe  
195 200 205

Met Thr Ser Glu Lys Ser Gln Thr Pro Leu Val Thr Leu Phe Lys Asn  
210 215 220

Ala Ile Ile Lys Asn Ala His Lys Lys Gly Gln  
225 230 235

<210> 21  
<211> 759  
<212> DNA  
<213> Gallus gallus

<400> 21  
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accaccgccca gcggcccatg ctgggagaac agcaagtgcc aggacctggc caccgaggct 120  
ggtgttttgc aggcgtgtgc caaggcatgc cgtgctgagc tgtcggccga ggcacccgtg 180  
taccggggca atgggcacct gcagcccctc tcggagagca tccgcaagta cgtgatgagc 240  
catttccgct ggaacaagtt cggccgtcgc aacagcagca gcggagggca caaaaggag 300  
gaggtggccg gcctcgccct gcctgccgcg tcacccacc accccgccgg ggaggaggaa 360

gatggagaag ggttggaacg agaggaaggg aagcgctcct actccatgga gcattttccgc 420  
tggggcaagc cgggtggggcg gaagaggaga cccatcaagg tgtaccccaa cggggtggac 480  
gaggagtcgg ctgagagtta ccccatggag ttccggaggg agatggcgcc cgatggggac 540  
cccttcggcc tctccgagga ggaggaagaa gaggaggaag aggaaggcga ggaggaaaag 600  
aaggatggag gctcgtaccg catgcggcac ttccgctggc acgcgccgct gaaggacaag 660  
cgctacggcg gcttcatgag cttggagcac agccagaccc cgctgatgac tctgttcaaa 720  
aacgccatcg tcaaaagcgc ctacaagaag ggtcagtga 759

<210> 22  
<211> 251  
<212> PRT  
<213> Gallus gallus

<400> 22

Met Arg Gly Ala Leu Cys His Ser Leu Pro Val Val Leu Gly Leu Leu  
1 5 10 15

Leu Cys His Pro Thr Thr Ala Ser Gly Pro Cys Trp Glu Asn Ser Lys  
20 25 30

Cys Gln Asp Leu Ala Thr Glu Ala Gly Val Leu Ala Cys Ala Lys Ala  
35 40 45

Cys Arg Ala Glu Leu Ser Ala Glu Ala Pro Val Tyr Pro Gly Asn Gly  
50 55 60

His Leu Gln Pro Leu Ser Glu Ser Ile Arg Lys Tyr Val Met Ser His  
65 70 75 80

Phe Arg Trp Asn Lys Phe Gly Arg Arg Asn Ser Ser Ser Gly Gly His  
85 90 95

Lys Arg Glu Glu Val Ala Gly Leu Ala Leu Pro Ala Ala Ser Pro His  
100 105 110

His Pro Ala Gly Glu Glu Glu Asp Gly Glu Gly Leu Glu Arg Glu Glu  
115 120 125

Gly Lys Arg Ser Tyr Ser Met Glu His Phe Arg Trp Gly Lys Pro Val  
130 135 140

Gly Arg Lys Arg Arg Pro Ile Lys Val Tyr Pro Asn Gly Val Asp Glu  
 145 150 155 160

Glu Ser Ala Glu Ser Tyr Pro Met Glu Phe Arg Arg Glu Met Ala Pro  
 165 170 175

Asp Gly Asp Pro Phe Gly Leu Ser Glu Glu Glu Glu Glu Glu Glu  
 180 185 190

Glu Glu Gly Glu Glu Glu Lys Lys Asp Gly Gly Ser Tyr Arg Met Arg  
 195 200 205

His Phe Arg Trp His Ala Pro Leu Lys Asp Lys Arg Tyr Gly Gly Phe  
 210 215 220

Met Ser Leu Glu His Ser Gln Thr Pro Leu Met Thr Leu Phe Lys Asn  
 225 230 235 240

Ala Ile Val Lys Ser Ala Tyr Lys Lys Gly Gln  
 245 250

<210> 23  
 <211> 780  
 <212> DNA  
 <213> Bufo marinus

<400> 23  
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 gggataactgg aatgtattaa agactgcaag atggctcctgt ctgcagagtc accagtgttt 180  
 cctgggaatg gacacatgca acccctctct gaaaacatca ggaagtatgt catgagccac 240  
 ttccgctgga ataagtttgg ccgaaggaat agcaccggtg gcgatagcaa caacgcaggt 300  
 tacaaacggg aagatatagc caactacccc atatttaacc tgttccccac taatgacaac 360  
 caaaacacac aagatggcaa catggaagaa gaactacgca ggcaagacaa caagaggtca 420  
 tattctatgg aacacttccg atggggtaaa ccagtcggga aaaaaaggag acctattaag 480  
 gttttcccaa gcgatgctga agaagaatca tctgaaatct scccaacaga gtacagaaga 540  
 gagttgtctg tagagtttga ctaccccgat accaactctg aagaagacat ggacgacagc 600  
 atgttgatgg aaagcccaaa tagaaaagat cggaagtata aaatgcatca ttttcgatgg 660

gaaggtccac ccaaagacaa aagatatgga ggattcatga cccctgagcg cagtcagact 720  
ccactaatga ctcttttcaa aaatgccatt atcaaaaatg cccacaagaa ggggtcaataa 780

<210> 24  
<211> 259  
<212> PRT  
<213> Bufo marinus

<220>  
<221> misc\_feature  
<222> (174)..(174)  
<223> Xaa can be any naturally occurring amino acid  
<400> 24

Met Leu Gln Pro Gly Trp Arg Cys Ile Leu Thr Ile Leu Gly Ala Phe  
1 5 10 15

Ile Phe His Val Gly Glu Val Lys Ser Gln Cys Trp Glu Ser Gly Lys  
20 25 30

Cys Ala Asp Leu Thr Ser Glu Asp Gly Ile Leu Glu Cys Ile Lys Asp  
35 40 45

Cys Lys Met Val Leu Ser Ala Glu Ser Pro Val Phe Pro Gly Asn Gly  
50 55 60

His Met Gln Pro Leu Ser Glu Asn Ile Arg Lys Tyr Val Met Ser His  
65 70 75 80

Phe Arg Trp Asn Lys Phe Gly Arg Arg Asn Ser Thr Gly Gly Asp Ser  
85 90 95

Asn Asn Ala Gly Tyr Lys Arg Glu Asp Ile Ala Asn Tyr Pro Ile Phe  
100 105 110

Asn Leu Phe Pro Thr Asn Asp Asn Gln Asn Thr Gln Asp Gly Asn Met  
115 120 125

Glu Glu Glu Leu Arg Arg Gln Asp Asn Lys Arg Ser Tyr Ser Met Glu  
130 135 140

His Phe Arg Trp Gly Lys Pro Val Gly Lys Lys Arg Arg Pro Ile Lys  
145 150 155 160

Val Phe Pro Ser Asp Ala Glu Glu Glu Ser Ser Glu Ile Xaa Pro Thr  
165 170 175

Glu Tyr Arg Arg Glu Leu Ser Val Glu Phe Asp Tyr Pro Asp Thr Asn  
180 185 190

Ser Glu Glu Asp Met Asp Asp Ser Met Leu Met Glu Ser Pro Asn Arg  
195 200 205

Lys Asp Arg Lys Tyr Lys Met His His Phe Arg Trp Glu Gly Pro Pro  
210 215 220

Lys Asp Lys Arg Tyr Gly Gly Phe Met Thr Pro Glu Arg Ser Gln Thr  
225 230 235 240

Pro Leu Met Thr Leu Phe Lys Asn Ala Ile Ile Lys Asn Ala His Lys  
245 250 255

Lys Gly Gln

<210> 25  
<211> 669  
<212> DNA  
<213> Cyprinus carpio

<400> 25  
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gctggtggat ctgaagtcag agctcagtgt atggaggacg cccgctgcag agacctcacc 120  
actgatgaga acatcttgga ctgcatacag ctatgcaggt ctgatctgac agatgaaacc 180  
cccgtctacc ctggagaaaag ccatttgcag cctccctctg agctggagca aaccgaggtc 240  
ctcgtacccc tgtccccagc ggccctcgct cctgctgagc aaatggaccc cgagtccagc 300  
cctcagcacg agcacaagcg ctctactcc atggagcatt tccgctgggg aaagccagtg 360  
ggtcgcaagc gcaggcctat caaggtgtac accaacggcg tggaggagga atccaccgag 420  
actctcccag ctgagatgag gcgagagctg gctacaaacg agatcgacta tcctcaagag 480  
gagggcgctt taaaccagca ggataagaag gatggctcct acaaaatgag ccatttccgc 540  
tggagcagcc cgcctgctag caagcgctat ggaggcttca tgaagtcctg ggacgagcgc 600  
agtcagaaac cccttctcac gctcttcaaa aacgtcataa acaaagagca ccagaagaag 660

gaccagtga

669

<210> 26  
<211> 222  
<212> PRT  
<213> Cyprinus carpio

<400> 26

Met Val Arg Gly Glu Arg Met Leu Cys Pro Ala Trp Leu Leu Ala Leu  
1 5 10 15

Ala Val Leu Cys Ala Ala Gly Ser Glu Val Arg Ala Gln Cys Met Glu  
20 25 30

Asp Ala Arg Cys Arg Asp Leu Thr Thr Asp Glu Asn Ile Leu Asp Cys  
35 40 45

Ile Gln Leu Cys Arg Ser Asp Leu Thr Asp Glu Thr Pro Val Tyr Pro  
50 55 60

Gly Glu Ser His Leu Gln Pro Pro Ser Glu Leu Glu Gln Thr Glu Val  
65 70 75 80

Leu Val Pro Leu Ser Pro Ala Ala Leu Ala Pro Ala Glu Gln Met Asp  
85 90 95

Pro Glu Ser Ser Pro Gln His Glu His Lys Arg Ser Tyr Ser Met Glu  
100 105 110

His Phe Arg Trp Gly Lys Pro Val Gly Arg Lys Arg Arg Pro Ile Lys  
115 120 125

Val Tyr Thr Asn Gly Val Glu Glu Glu Ser Thr Glu Thr Leu Pro Ala  
130 135 140

Glu Met Arg Arg Glu Leu Ala Thr Asn Glu Ile Asp Tyr Pro Gln Glu  
145 150 155 160

Glu Gly Ala Leu Asn Gln Gln Asp Lys Lys Asp Gly Ser Tyr Lys Met  
165 170 175

Ser His Phe Arg Trp Ser Ser Pro Pro Ala Ser Lys Arg Tyr Gly Gly  
180 185 190

Phe Met Lys Ser Trp Asp Glu Arg Ser Gln Lys Pro Leu Leu Thr Leu  
 195 200 205

Phe Lys Asn Val Ile Asn Lys Glu His Gln Lys Lys Asp Gln  
 210 215 220

<210> 27  
 <211> 669  
 <212> DNA  
 <213> Danio rerio

<400> 27  
 atggtgaggg gagtgaggat gttgtgtcct gcttggctct tggctctggc tgttctctgc 60  
 gcaggaggat ctgaagtcag agctcagtggt tgggaaaatg cccgctgtcg agacctcagc 120  
 acagaggaga acatcttggga atgcatacaa ttatgcaggt ctgaacttac agatgaaacc 180  
 cccgtctacc ctggagaaaag ccatctacag cctccctccg agccggagca aatcgacctc 240  
 ctcgcacacc tttccctgt agcactcgca gccctgaac agatagagcc ggagtccggc 300  
 cctcgacacg accacaagcg ctctactcc atggaacact tccggtgggg caaaccggtc 360  
 ggccgcaaac gcagacccat caaggtgtac acgaacggcg tggaagagga atccgccgaa 420  
 acgcttccgg aagagatgag acgcgagctg gcaaataacg aggtcgacta tccgcaagaa 480  
 gagatgcctt taaacccact gggaaagaag gacccccctt acaaaatgac ccatttccgc 540  
 tggagcgctc cgccggctag caagcgctat ggaggcttca tgaagtcctg ggacgagcgt 600  
 gctcagaaac cactgctcac actcttcaaa aacgtaatgc ataaaggcca accgaggaag 660  
 gatgagtga 669

<210> 28  
 <211> 222  
 <212> PRT  
 <213> Danio rerio

<400> 28

Met Val Arg Gly Val Arg Met Leu Cys Pro Ala Trp Leu Leu Ala Leu  
 1 5 10 15

Ala Val Leu Cys Ala Gly Gly Ser Glu Val Arg Ala Gln Cys Trp Glu  
 20 25 30

Asn Ala Arg Cys Arg Asp Leu Ser Thr Glu Glu Asn Ile Leu Glu Cys



35	40	45	
Ile Gln Leu Cys Arg Ser Glu Leu Thr Asp Glu Thr Pro Val Tyr Pro			
50	55	60	
Gly Glu Ser His Leu Gln Pro Pro Ser Glu Pro Glu Gln Ile Asp Leu			
65	70	75	80
Leu Ala His Leu Ser Pro Val Ala Leu Ala Ala Pro Glu Gln Ile Glu			
85	90	95	
Pro Glu Ser Gly Pro Arg His Asp His Lys Arg Ser Tyr Ser Met Glu			
100	105	110	
His Phe Arg Trp Gly Lys Pro Val Gly Arg Lys Arg Arg Pro Ile Lys			
115	120	125	
Val Tyr Thr Asn Gly Val Glu Glu Glu Ser Ala Glu Thr Leu Pro Glu			
130	135	140	
Glu Met Arg Arg Glu Leu Ala Asn Asn Glu Val Asp Tyr Pro Gln Glu			
145	150	155	160
Glu Met Pro Leu Asn Pro Leu Gly Lys Lys Asp Pro Pro Tyr Lys Met			
165	170	175	
Thr His Phe Arg Trp Ser Val Pro Pro Ala Ser Lys Arg Tyr Gly Gly			
180	185	190	
Phe Met Lys Ser Trp Asp Glu Arg Ala Gln Lys Pro Leu Leu Thr Leu			
195	200	205	
Phe Lys Asn Val Met His Lys Gly Gln Pro Arg Lys Asp Glu			
210	215	220	

<210> 29  
 <211> 792  
 <212> DNA  
 <213> Rana catesbeiana

<400> 29	
atgttgacagc cagtctggca cgcctgtatc ctggcaatac ttgggggtgtt catatttcac	60
gtcggagagg tccggagcca gtgctgggaa agcaataagt gtacagattt aagcagcgaa	120

gatggcattc tggaatgtat caaagcatgc aagatggacc tctctgcaga atctcccgtg	180
tttcccggca atggccacat ccagcccctt tctgaaaaca tcaggaaata tgtcatgagc	240
cactttcgtc ggaataaatt tggtagaagg aacagcacca gcaatgacaa caacaacaac	300
aatggtggct ataagcggga ggatattgcc aactacccta tattgaacct gttccttggc	360
agcgacaacc aaaacacaca ggagggaatt atggaagatg acgccttgga taggcaagac	420
agcaaaaggt cttattccat ggagcacttc cgatggggaa aacccgtcgg caagaagagg	480
aggcctatca aagttttccc cacagatgct gaagaagagt cctcagaaag tttccccatt	540
gagctgagaa gagagctctc tctagagttt gactatcctg acaccaactc cgaagaagaa	600
ttggataatg gcgagctgct agaaggtcca gttaaaaaag gtaggaagta caaaatgcac	660
catttccgat gggaaggacc tcccaaagac aagcggtatg gtggatttat gaccccagag	720
agaagccaga cacctttaat gactcttttc aagaatgcta taattaagaa cgcccacaaa	780
aagggccagt ag	792

<210> 30  
 <211> 263  
 <212> PRT  
 <213> Rana catesbeiana

<400> 30

Met	Leu	Gln	Pro	Val	Trp	His	Ala	Cys	Ile	Leu	Ala	Ile	Leu	Gly	Val
1				5					10					15	

Phe	Ile	Phe	His	Val	Gly	Glu	Val	Arg	Ser	Gln	Cys	Trp	Glu	Ser	Asn
			20					25					30		

Lys	Cys	Thr	Asp	Leu	Ser	Ser	Glu	Asp	Gly	Ile	Leu	Glu	Cys	Ile	Lys
		35					40					45			

Ala	Cys	Lys	Met	Asp	Leu	Ser	Ala	Glu	Ser	Pro	Val	Phe	Pro	Gly	Asn
	50					55					60				

Gly	His	Ile	Gln	Pro	Leu	Ser	Glu	Asn	Ile	Arg	Lys	Tyr	Val	Met	Ser
65					70					75				80	

His	Phe	Arg	Trp	Asn	Lys	Phe	Gly	Arg	Arg	Asn	Ser	Thr	Ser	Asn	Asp
				85						90				95	

Asn	Asn	Asn	Asn	Asn	Gly	Gly	Tyr	Lys	Arg	Glu	Asp	Ile	Ala	Asn	Tyr
-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----

100

105

110

Pro Ile Leu Asn Leu Phe Leu Gly Ser Asp Asn Gln Asn Thr Gln Glu  
 115 120 125

Gly Ile Met Glu Asp Asp Ala Leu Asp Arg Gln Asp Ser Lys Arg Ser  
 130 135 140

Tyr Ser Met Glu His Phe Arg Trp Gly Lys Pro Val Gly Lys Lys Arg  
 145 150 155 160

Arg Pro Ile Lys Val Phe Pro Thr Asp Ala Glu Glu Glu Ser Ser Glu  
 165 170 175

Ser Phe Pro Ile Glu Leu Arg Arg Glu Leu Ser Leu Glu Phe Asp Tyr  
 180 185 190

Pro Asp Thr Asn Ser Glu Glu Glu Leu Asp Asn Gly Glu Leu Leu Glu  
 195 200 205

Gly Pro Val Lys Lys Gly Arg Lys Tyr Lys Met His His Phe Arg Trp  
 210 215 220

Glu Gly Pro Pro Lys Asp Lys Arg Tyr Gly Gly Phe Met Thr Pro Glu  
 225 230 235 240

Arg Ser Gln Thr Pro Leu Met Thr Leu Phe Lys Asn Ala Ile Ile Lys  
 245 250 255

Asn Ala His Lys Lys Gly Gln  
 260

<210> 31  
 <211> 272  
 <212> PRT  
 <213> Monodelphis domestica

<400> 31

Met Pro Lys Pro Ser Trp Ser Tyr Leu Gly Ala Leu Leu Val Ala Val  
 1 5 10 15

Leu Phe Gln Ala Ser Val Glu Val His Gly Trp Cys Leu Gln Ala Ser  
 20 25 30

Asn Cys Arg Asp Ser Lys Ala Glu Asp Gly Leu Val Glu Cys Ile Lys  
35 40 45

Ser Cys Lys Met Asp Leu Ser Ala Glu Ser Pro Val Phe Pro Gly Asn  
50 55 60

Gly Gln Tyr Glu Pro Leu Ser Glu Asn Ile Arg Lys Tyr Val Met Ser  
65 70 75 80

His Phe Arg Trp Asn Lys Phe Gly Arg Arg Asn Ile Ser Ser Gly Ser  
85 90 95

Ile Ser Ser Asp Gly Gly Asn Val Gly Gln Lys Arg Gln Glu Leu Met  
100 105 110

Gln Gly Asp Phe Leu Asp Leu Pro Pro Pro Gly Val Trp Gly Glu Asp  
115 120 125

Glu Glu Met Gln Glu Gly Leu Pro Leu Ile Arg Lys Ala Arg Glu Leu  
130 135 140

Gln Asn Lys Arg Ser Tyr Ser Met Glu His Phe Arg Trp Gly Lys Pro  
145 150 155 160

Val Gly Lys Lys Arg Arg Pro Val Lys Ile Tyr Pro Asn Gly Val Glu  
165 170 175

Glu Glu Ser Ala Glu Ser Tyr Pro Val Glu Ile Arg Arg Asp Leu Pro  
180 185 190

Met Lys Ile Asn Phe Pro Glu Tyr Pro Glu Leu Ala Ile Asp Glu Glu  
195 200 205

Glu Ala Ala Lys Glu Val Tyr Glu Glu Lys Val Lys Lys Asp Gly Gly  
210 215 220

Gly Tyr Lys Met Glu His Phe Arg Trp Gly Thr Pro Pro Lys Asp Lys  
225 230 235 240

Arg Tyr Gly Gly Phe Met Ile Ser Glu Lys Ser His Thr Pro Leu Met  
245 250 255

Thr Leu Phe Lys Asn Ala Ile Ile Lys Asn Gly His Lys Lys Gly Gln  
 260 265 270

<210> 32  
 <211> 263  
 <212> PRT  
 <213> Ovis aries

<220>  
 <221> misc\_feature  
 <222> (184)..(184)  
 <223> Xaa can be any naturally occurring amino acid

<400> 32

Met Pro Arg Leu Cys Ser Ser Arg Ser Gly Ala Leu Leu Leu Val Leu  
 1 5 10 15

Leu Leu Gln Ala Ser Met Glu Val Arg Gly Trp Cys Leu Glu Ser Ser  
 20 25 30

Gln Cys Gln Asp Leu Thr Thr Glu Ser Asn Leu Leu Ala Cys Ile Arg  
 35 40 45

Ala Cys Lys Pro Asp Leu Ser Ala Glu Thr Pro Val Phe Pro Gly Asn  
 50 55 60

Gly Asp Glu Gln Pro Leu Thr Glu Asn Pro Arg Lys Tyr Val Met Gly  
 65 70 75 80

His Phe Arg Trp Asp Arg Phe Gly Arg Arg Asn Gly Ser Ser Ser Phe  
 85 90 95

Gly Ala Gly Gly Ala Ala Gln Lys Arg Glu Glu Glu Val Ala Val Gly  
 100 105 110

Glu Gly Pro Gly Pro Arg Gly Asp Gly Ala Glu Thr Gly Pro Arg Glu  
 115 120 125

Asp Lys Arg Ser Tyr Ser Met Glu His Phe Arg Trp Gly Lys Pro Val  
 130 135 140

Gly Lys Lys Arg Arg Pro Val Lys Val Tyr Pro Asn Gly Ala Glu Asp  
 145 150 155 160

Glu Ser Ala Gln Ala Phe Pro Leu Glu Phe Lys Arg Glu Leu Thr Gly  
165 170 175

Glu Arg Leu Glu Gln Ala Arg Xaa Pro Glu Ala Gln Ala Glu Ser Ala  
180 185 190

Ala Ala Arg Ala Glu Leu Glu Tyr Gly Leu Val Ala Glu Ala Glu Ala  
195 200 205

Ala Glu Lys Lys Asp Ser Gly Pro Tyr Lys Met Glu His Phe Arg Trp  
210 215 220

Gly Ser Pro Pro Lys Asp Lys Arg Tyr Gly Gly Phe Met Thr Ser Glu  
225 230 235 240

Lys Ser Gln Thr Pro Leu Val Thr Leu Phe Lys Asn Ala Ile Ile Lys  
245 250 255

Asn Ala His Lys Lys Gly Gln  
260

<210> 33  
<211> 212  
<212> PRT  
<213> Ovis aries

<220>  
<221> misc\_feature  
<222> (120)..(121)  
<223> Xaa can be any naturally occurring amino acid  
<400> 33

Pro Asp Leu Ser Ala Glu Thr Pro Val Phe Pro Gly Asn Cys Asp Glu  
1 5 10 15

Gln Pro Leu Thr Glu Asn Pro Arg Lys Tyr Val Met Gly His Phe Arg  
20 25 30

Trp Asp Arg Phe Gly Arg Arg Asn Gly Ser Ser Ser Phe Gly Ala Gly  
35 40 45

Gly Ala Ala Gln Lys Arg Glu Glu Val Ala Val Gly Glu Gly Pro  
50 55 60

Gly Pro Arg Gly Asp Gly Ala Glu Thr Gly Pro Arg Glu Asp Lys Arg  
65 70 75 80

Ser Tyr Ser Met Glu His Phe Arg Trp Gly Lys Pro Val Gly Lys Lys  
85 90 95

Arg Arg Pro Val Lys Val Tyr Pro Asn Gly Ala Glu Asp Glu Ser Ala  
100 105 110

Gln Ala Phe Pro Leu Glu Phe Xaa Xaa Glu Leu Thr Gly Glu Arg Leu  
115 120 125

Glu Gln Ala Arg Gly Pro Glu Ala Gln Ala Glu Ser Ala Ala Ala Arg  
130 135 140

Ala Glu Leu Glu Tyr Gly Leu Val Ala Glu Ala Glu Ala Ala Glu Lys  
145 150 155 160

Lys Asp Ser Gly Pro Tyr Lys Met Glu His Phe Arg Trp Gly Ser Pro  
165 170 175

Pro Lys Asp Lys Arg Tyr Gly Gly Phe Met Thr Ser Glu Lys Ser Gln  
180 185 190

Thr Pro Leu Val Thr Leu Phe Lys Asn Ala Ile Ile Lys Asn Ala His  
195 200 205

Lys Lys Gly Gln  
210

<210> 34  
<211> 263  
<212> PRT  
<213> Rana catesbeiana

<400> 34

Met Leu Gln Pro Val Trp His Ala Cys Ile Leu Ala Ile Leu Gly Val  
1 5 10 15

Phe Ile Phe His Val Gly Glu Val Arg Ser Gln Cys Trp Glu Ser Asn  
20 25 30

Lys Cys Thr Asp Leu Ser Ser Glu Asp Gly Ile Leu Glu Cys Ile Lys  
35 40 45

Ala Cys Lys Met Asp Leu Ser Ala Glu Ser Pro Val Phe Pro Gly Asn  
50 55 60

Gly His Ile Gln Pro Leu Ser Glu Asn Ile Arg Lys Tyr Val Met Ser  
65 70 75 80

His Phe Arg Trp Asn Lys Phe Gly Arg Arg Asn Ser Thr Ser Asn Asp  
85 90 95

Asn Asn Asn Asn Asn Gly Gly Tyr Lys Arg Glu Asp Ile Ala Asn Tyr  
100 105 110

Pro Ile Leu Asn Leu Phe Leu Gly Ser Asp Asn Gln Asn Thr Gln Glu  
115 120 125

Gly Ile Met Glu Asp Asp Ala Leu Asp Arg Gln Asp Ser Lys Arg Ser  
130 135 140

Tyr Ser Met Glu His Phe Arg Trp Gly Lys Pro Val Gly Lys Lys Arg  
145 150 155 160

Arg Pro Ile Lys Val Phe Pro Thr Asp Ala Glu Glu Glu Ser Ser Glu  
165 170 175

Ser Phe Pro Ile Glu Leu Arg Arg Glu Leu Ser Leu Glu Phe Asp Tyr  
180 185 190

Pro Asp Thr Asn Ser Glu Glu Glu Leu Asp Asn Gly Glu Leu Leu Glu  
195 200 205

Gly Pro Val Lys Lys Gly Arg Lys Tyr Lys Met His His Phe Arg Trp  
210 215 220

Glu Gly Pro Pro Lys Asp Lys Arg Tyr Gly Gly Phe Met Thr Pro Glu  
225 230 235 240

Arg Ser Gln Thr Pro Leu Met Thr Leu Phe Lys Asn Ala Ile Ile Lys  
245 250 255

Asn Ala His Lys Lys Gly Gln  
260



<210> 35  
 <211> 258  
 <212> PRT  
 <213> *Spea multiplicata*

<400> 35

Met Leu Cys Pro Val Trp Ser Cys Leu Phe Ala Val Leu Gly Val Phe  
 1 5 10 15

Val Phe His Val Gly Glu Val Arg Gly Gln Cys Trp Gln Ser Ala Lys  
 20 25 30

Cys Met Asp Leu Glu Ser Glu Asp Gly Ile Leu Glu Cys Ile Lys Ala  
 35 40 45

Cys Lys Thr Asp Leu Ser Ala Glu Ser Pro Ile Phe Pro Gly Asn Gly  
 50 55 60

His Leu Gln Pro Leu Ala Glu Asn Val Arg Lys Tyr Val Met Ser His  
 65 70 75 80

Phe Arg Trp Asn Lys Phe Gly Arg Arg Asn Thr Thr Gly Asn Glu Gly  
 85 90 95

Asn Ser Gly Ser Lys Arg Glu Asp Ile Ala Asn Tyr Pro Ile Phe Asn  
 100 105 110

Leu Phe Pro Ser Ser Asn Gly Gln Asn Thr Glu Asp Asn Met Trp Lys  
 115 120 125

Lys Tyr Gln Asp Arg Gln Asp Asn Lys Arg Ser Tyr Ser Met Glu His  
 130 135 140

Phe Arg Trp Gly Lys Pro Val Gly Arg Lys Arg Arg Pro Ile Lys Val  
 145 150 155 160

Phe Pro Asn Gly Met Glu Glu Glu Ser Ser Glu Ser Tyr Pro Met Glu  
 165 170 175

Leu Arg Arg Glu Leu Ser Leu Glu Asp Asp Tyr Pro Glu Ile Asp Ser  
 180 185 190

Glu Asp Asp Leu Asp Tyr Asn Asp Leu Leu Ser Met Pro Lys Phe Lys

195

200

205

Gly Gly Asp Tyr Arg Ile His His Phe Arg Trp Gly Ser Pro Pro Lys  
 210 215 220

Asp Lys Arg Tyr Gly Gly Phe Met Thr Pro Glu Arg Ser Gln Thr Pro  
 225 230 235 240

Leu Met Thr Leu Phe Lys Asn Ala Ile Ile Lys Asn Ala His Lys Lys  
 245 250 255

Ala Gln

<210> 36  
 <211> 259  
 <212> PRT  
 <213> Xenopus laevis

<400> 36

Met Phe Arg Pro Leu Trp Gly Cys Phe Leu Ala Ile Leu Gly Ile Cys  
 1 5 10 15

Ile Phe His Ile Gly Glu Val Gln Ser Gln Cys Trp Glu Ser Ser Arg  
 20 25 30

Cys Ala Asp Leu Ser Ser Glu Asp Gly Val Leu Glu Cys Ile Lys Ala  
 35 40 45

Cys Lys Thr Asp Leu Ser Ala Glu Ser Pro Val Phe Pro Gly Asn Gly  
 50 55 60

His Leu Gln Pro Leu Ser Glu Ser Ile Arg Lys Tyr Val Met Thr His  
 65 70 75 80

Phe Arg Trp Asn Lys Phe Gly Arg Arg Asn Ser Thr Gly Asn Asp Gly  
 85 90 95

Ser Asn Thr Gly Tyr Lys Arg Glu Asp Ile Ser Ser Tyr Pro Val Phe  
 100 105 110

Ser Leu Phe Pro Leu Ser Asp Gln Asn Ala Pro Gly Asp Asn Met Glu  
 115 120 125

Glu Glu Pro Leu Asp Arg Gln Glu Asn Lys Arg Ala Tyr Ser Met Glu  
 130 135 140

His Phe Arg Trp Gly Lys Pro Val Gly Arg Lys Arg Arg Pro Ile Lys  
 145 150 155 160

Val Tyr Pro Asn Gly Val Glu Glu Glu Ser Ala Glu Ser Tyr Pro Met  
 165 170 175

Glu Leu Arg Arg Glu Leu Ser Leu Glu Leu Asp Tyr Pro Glu Ile Asp  
 180 185 190

Leu Asp Glu Asp Ile Glu Asp Asn Glu Val Lys Ser Ala Leu Thr Lys  
 195 200 205

Lys Asn Gly Asn Tyr Arg Met His His Phe Arg Trp Gly Ser Pro Pro  
 210 215 220

Lys Asp Lys Arg Tyr Gly Gly Phe Met Thr Pro Glu Arg Ser Gln Thr  
 225 230 235 240

Pro Leu Met Thr Leu Phe Lys Asn Ala Ile Ile Lys Asn Ser His Lys  
 245 250 255

Lys Gly Gln

<210> 37  
 <211> 262  
 <212> PRT  
 <213> Necturus maculosus

<220>  
 <221> misc\_feature  
 <222> (129)..(129)  
 <223> Xaa can be any naturally occurring amino acid

<400> 37

Met Leu Lys Pro Val Trp Ser Cys Leu Phe Ala Thr Leu Gly Ala Leu  
 1 5 10 15

Leu Cys Gln Thr Val Val Ala His Ser Gln Cys Trp Glu Ser Ser Lys  
 20 25 30

Cys Arg Asp Leu Ala Thr Glu Gly Ser Val Leu Glu Cys Ile Lys Ala  
35 40 45

Cys Lys Val Glu Leu Ser Ala Glu Ser Pro Val Tyr Pro Gly Asn Gly  
50 55 60

His Met Gln Pro Leu Ser Glu Asn Ile Arg Lys Tyr Val Met Ser His  
65 70 75 80

Phe Arg Trp Asn Gln Phe Gly Arg Lys Asn Ser Thr Val Ala Ser Gly  
85 90 95

Asn Gly Ala Gly Ser Lys Arg Glu Glu Leu Ser Gly Asn Pro Ile Ile  
100 105 110

Ser Leu Phe Thr Thr Ser Glu Ser Gln Ser Ser Gly Ala His Asp Ser  
115 120 125

Xaa Lys Glu Gly Glu Val Met Asp Arg Gln Asp Asn Lys Arg Ser Tyr  
130 135 140

Ser Met Glu His Phe Arg Trp Gly Lys Pro Val Gly Arg Lys Arg Arg  
145 150 155 160

Pro Ile Lys Val Tyr Pro Asn Gly Val Glu Glu Glu Ser Ser Glu Ser  
165 170 175

Tyr Pro Leu Glu Leu Lys Arg Asp Leu Ser Leu Gly Leu Glu Tyr Pro  
180 185 190

Glu Phe Asp Ser Gln Glu Gly Leu Glu Asn Asn Glu Val Met Val Val  
195 200 205

Leu Pro Glu Lys Lys Asp Gly Asn Tyr Arg Met His His Phe Arg Trp  
210 215 220

Gly Ser Pro Pro Lys Asp Lys Arg Tyr Gly Gly Phe Met Thr Pro Glu  
225 230 235 240

Arg Ser Gln Thr Pro Leu Met Thr Leu Phe Lys Asn Ala Ile Lys Asn  
245 250 255

Ala His Lys Lys Gly Gln  
260

<210> 38  
<211> 262  
<212> PRT  
<213> Amphiuma means

<400> 38

Met Leu Arg Pro Val Trp Ser Cys Leu Pro Ala Thr Leu Gly Ala Leu  
1 5 10 15

Leu Cys Gln Thr Ala Gly Ala Asn Ser Gln Cys Trp Glu Ser Ser Lys  
20 25 30

Cys Arg Asp Leu Ala Thr Glu Gly Ser Val Leu Glu Cys Ile Lys Ala  
35 40 45

Cys Lys Val Glu Leu Ser Ala Glu Ser Pro Val Tyr Pro Gly Asn Gly  
50 55 60

His Met Gln Pro Leu Ser Glu Asn Ile Arg Lys Tyr Val Met Ser His  
65 70 75 80

Phe Arg Trp Asn Lys Phe Gly Arg Lys Asn Ser Thr Ser Val Ser Gly  
85 90 95

Asn Ser Ala Gly Asn Lys Arg Glu Glu Leu Ser Asn Asn Pro Ile Ile  
100 105 110

Ser Leu Phe Thr Thr Ser Glu Ser Gln Ser Ser Gly Ala Asp Asp Gly  
115 120 125

Asn Lys Glu Gly Glu Ala Met Glu Arg Gln Asp Ser Lys Arg Ser Tyr  
130 135 140

Ser Met Glu His Phe Arg Trp Gly Lys Pro Val Gly Arg Lys Arg Arg  
145 150 155 160

Pro Ile Lys Val Tyr Pro Asn Gly Val Glu Glu Glu Ser Ser Glu Ser  
165 170 175

Tyr Pro Leu Glu Leu Arg Arg Asp Leu Ser Leu Gly Leu Asp Tyr Pro  
180 185 190

Asp Ser Asp Ser Gln Glu Gly Leu Glu Asn Asn Glu Ile Thr Thr Gly  
195 200 205

Leu Thr Lys Lys Asn Asp Lys Gln Tyr Arg Ile Gly His Phe Arg Trp  
210 215 220

Gly Ser Pro Leu Lys Asp Lys Arg Tyr Gly Gly Phe Met Thr Pro Glu  
225 230 235 240

Arg Ser Gln Thr Pro Leu Met Thr Leu Phe Lys Asn Ala Ile Lys Asn  
245 250 255

Ala His Lys Lys Gly Gln  
260

<210> 39  
<211> 261  
<212> PRT  
<213> Pelodiscus sinensis

<400> 39

Met Leu Lys Pro Val Arg Ser Gly Leu Leu Ala Ile Leu Gly Val Leu  
1 5 10 15

Leu Phe His Ala Asp Gly Gly Val His Ser Gln Cys Trp Asp Ser Ser  
20 25 30

Arg Cys Arg Glu Leu Ser Thr Asp Ala Gly Leu Leu Glu Cys Ile Lys  
35 40 45

Ala Cys Lys Met Asp Leu Ser Asp Glu Ser Pro Met Tyr Pro Gly Asn  
50 55 60

Gly His Leu Gln Pro Leu Ser Glu Asn Ile Arg Lys Tyr Val Met Ser  
65 70 75 80

His Phe Arg Trp Asn Lys Phe Gly Arg Lys Asn Ser Ser Ser Ser Val  
85 90 95

Ala Gly His Lys Arg Glu Glu Ile Pro Ser His Leu Leu Leu Gly Leu  
100 105 110

Phe Pro Asp Val Ala Pro Ala Gln Arg Gly Asp Asp Gly Glu Gly Gly  
115 120 125

Ala Ala Leu Glu Arg Gln Asp Ser Lys Arg Ser Tyr Ser Met Glu His  
130 135 140

Phe Arg Trp Gly Lys Pro Val Gly Arg Lys Arg Arg Pro Ile Lys Val  
145 150 155 160

Tyr Pro Ser Glu Val Glu Glu Glu Ser Ala Glu Ser Tyr Pro Pro Glu  
165 170 175

Phe Arg Arg Asp Leu Ser Met Glu Leu Asp Tyr Pro Glu Phe Glu Ser  
180 185 190

Leu Glu Asp Pro Glu Ser Glu Glu Ala Leu Val Ser Glu Glu Ala Glu  
195 200 205

Lys Lys Asp Gly Asn Ser Tyr Lys Met His His Phe Arg Trp Asn Ala  
210 215 220

Pro Pro Lys Asp Lys Arg Tyr Gly Gly Phe Met Thr Ser Glu Ser Ser  
225 230 235 240

Gln Thr Pro Leu Met Thr Leu Phe Lys Asn Ala Ile Ile Lys Asn Ala  
245 250 255

Tyr Lys Lys Gly Gln  
260

<210> 40

<211> 187

<212> PRT

<213> Pan troglodytes

<400> 40

Ser Ala Glu Thr Pro Met Phe Pro Gly Asn Gly Asp Glu Gln Pro Leu  
1 5 10 15

Thr Glu Asn Pro Arg Lys Tyr Val Met Gly His Phe Arg Trp Asp Arg  
20 25 30

Phe Gly Arg Arg Asn Ser Ser Ser Ser Ser Gly Ser Gly Ala Gly  
35 40 45

Gln Lys Arg Glu Asp Val Ser Ala Gly Glu Asp Arg Gly Pro Leu Pro  
50 55 60

Glu Gly Gly Pro Glu Pro Arg Ser Asp Gly Ala Lys Pro Gly Pro Arg  
65 70 75 80

Glu Gly Lys Arg Ser Tyr Ser Met Glu His Phe Arg Trp Gly Lys Pro  
85 90 95

Val Gly Lys Lys Arg Arg Pro Val Lys Val Tyr Pro Asn Gly Ala Glu  
100 105 110

Asp Glu Ser Ala Glu Ala Phe Pro Leu Glu Phe Lys Arg Glu Leu Thr  
115 120 125

Gly Gln Arg Pro Arg Glu Gly Asp Gly Pro Asp Gly Pro Ala Asp Asp  
130 135 140

Gly Ala Gly Ala Gln Ala Asp Leu Glu His Ser Leu Leu Val Ala Ala  
145 150 155 160

Glu Lys Lys Asp Glu Gly Pro Tyr Arg Met Glu His Phe Arg Trp Gly  
165 170 175

Ser Pro Pro Lys Asp Lys Arg Tyr Gly Gly Phe  
180 185

<210> 41  
<211> 20  
<212> DNA  
<213> Artificial

<220>  
<223> SYNTHETIC OLIGONUCLEOTIDE

<400> 41  
gcttgcaaac tcgacctctc

20

<210> 42  
<211> 20  
<212> DNA  
<213> Artificial

<220>  
<223> SYNTHETIC OLIGONUCLEOTIDE



<400> 42  
cttgatgatg gcgttcttga 20

<210> 43  
<211> 22  
<212> DNA  
<213> Artificial

<220>  
<223> SYNTHETIC OLIGONUCLEOTIDE

<400> 43  
agggcatcag aaggcctgac ca 22

<210> 44  
<211> 22  
<212> DNA  
<213> Artificial

<220>  
<223> SYNTHETIC OLIGONUCLEOTIDE

<400> 44  
cttgaagaag cggcagtagc ac 22

<210> 45  
<211> 20  
<212> DNA  
<213> Artificial

<220>  
<223> SYNTHETIC OLIGONUCLEOTIDE

<400> 45  
gcttgcaaac tcgacctctc 20

<210> 46  
<211> 20  
<212> DNA  
<213> Artificial

<220>  
<223> SYNTHETIC OLIGONUCLEOTIDE

<400> 46  
cttgatgatg gcgttcttga 20

<210> 47  
<211> 21  
<212> DNA  
<213> Artificial

<220>  
 <223> SYNTHETIC OLIGONUCLEOTIDE  
  
 <400> 47  
 atggggctgt gtggactgac c 21  
  
 <210> 48  
 <211> 22  
 <212> DNA  
 <213> Artificial  
  
 <220>  
 <223> SYNTHETIC OLIGONUCLEOTIDE  
  
 <400> 48  
 gtcaggagag caagtttcat tt 22  
  
 <210> 49  
 <211> 22  
 <212> DNA  
 <213> Artificial  
  
 <220>  
 <223> SYNTHETIC OLIGONUCLEOTIDE  
  
 <400> 49  
 agggcatcag aaggcctgac ca 22  
  
 <210> 50  
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